Individual differences in self-affirmation: distinguishing self-affirmation from positive self-regard

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RUNNING HEAD: SELF-AFFIRMATION: INDIVIDUAL DIFFERENCES

Individual Differences in Self-Affirmation: Distinguishing Self-Affirmation from Positive Self-Regard

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Abstract

Research into self-affirmation has almost exclusively employed experimental manipulations. In this paper we address individual differences in the tendency to respond to threats with self-affirming cognitions and distinguish this from two overlapping constructs: habitual positive self-thought and trait self-esteem. Items we designed to measure self-affirmation were represented by three first-order factors and loaded on a higher-order factor, creating the Spontaneous Self-Affirmation Measure (SSAM). The SSAM correlated moderately with self-esteem and habitual positive self-thought. In competitive analyses, the SSAM was an independent predictor of a large number of outcomes. The studies provide evidence about the correlates of individual differences in reported spontaneous self-affirmation in response to threat and the contribution made to this response by habitual positive self-thought and trait self-esteem.

Individual Differences in Self-affirmation: Distinguishing Self-Affirmation and Positive Self-Regard

According to Self-Affirmation Theory (Steele, 1988) people are motivated to maintain a self-concept they experience as being "adaptively and morally adequate" (Steele, 1988, p. 262). When this self-perception is threatened, they can bolster or restore this experience of self-adequacy through self-affirmation. People can self-affirm through "explanation, rationalization and/or action" (Steele, 1988, p. 262). For example, they may think about their personal strengths, bring to mind their core values, reflect upon their important relationships, or act in a way that demonstrates their moral or adaptive adequacy. Considerable evidence has now accumulated of the prophylactic and restorative effects of self-affirmation on processes and outcomes affected by a wide range of threats to the self, including those arising from performance expectations associated with stereotypes, health-promotion materials, and stress (see Cohen & Sherman, 2014; Harris & Epton, 2009, 2010; Sherman & Cohen, 2006, for reviews).

In the decades since Steele outlined the theory, researchers have prioritized experimental manipulations in which participants are instructed to self-affirm rather than doing so spontaneously in response to perceived threats. In the process, much has been learned about the effects of self-affirmation. Nevertheless, this has led to a disjunction between the empirical findings and those theoretical elements that describe how self-affirmation functions as a natural, even spontaneous response to everyday self-threats.

We are conducting a program of research into natural, undirected, spontaneous self-affirmation that is designed to help redress this imbalance. Here we report the findings from five studies from this program, with others being reported in supplemental

materials. In particular, we explore in this paper the role of three inter-related elements: (a) the tendency to respond to threats with affirming self-related cognitions, (b) the tendency to automatically and habitually think positively about the self, and (c) trait self-esteem. Our guiding assumption is that spontaneous self-affirmation has an existence separate from automatic positive self-related cognitions and self-esteem, although the latter two concepts are expected to correlate positively with it. We begin by briefly summarizing the core findings from several decades of research on self-affirmation before introducing our approach and measures.

Self-Affirmation and Threats to Self-Integrity

People are hypothesized to self-affirm when they experience a threat to their "self-integrity" or sense of moral and adaptive adequacy (Steele, 1988). Such "psychological threat[s]" arise from "the perception of an environmental challenge to the adequacy of the self" (Cohen & Sherman, 2014, p. 335). Psychological threats are ubiquitous and often commonplace (e.g., slights and experiences of failure). Self-affirmation enables those disturbed by such threats to bolster their sense of self-adequacy (Cohen & Sherman, 2014).

To self-affirm, people turn to the qualities that are central to how they see themselves. Self-affirmation involves bringing to mind any self-conception or image that bolsters or restores the individual's sense of being "competent, good, coherent, …" or of otherwise possessing self-integrity (Steele, 1988, p. 262). By making such self-defining sources of identity salient, self-affirmation serves to provide perspective and reassurance to the individual confronting a psychological threat (Cohen & Sherman, 2014; Sherman &

Cohen, 2006). As a consequence, self-affirmation can promote stability in self-perception in the face of psychological threat.

Developed out of Steele's reinterpretation of Cognitive Dissonance Theory (e.g., Steele, 1975) one of the key insights of Self-Affirmation Theory is that, when coping with psychological threats, people are not restricted to dealing with the focal or provoking threat. As well as coping by trying to reduce or eliminate the threat, or diminishing perceptions of its severity or personal relevance, they can respond by self-affirming. For example, smoking can pose not only a physical threat to health, but also a psychological threat, by challenging a smoker's sense that she acts sensibly and controls important behavior. According to Self-Affirmation Theory, a smoker may cope with this threat to self-adequacy by self-affirming, employing any cognition or action of sufficient importance to her sense of being a worthwhile and adequate person that it offsets the challenge that smoking presents to her self-integrity. She may, for example, remind herself that she is a good mother or daughter or a talented musician. This is because, according to the theory, "people are concerned with the big picture: they regulate their defensive adaptations to maintain very general conceptions of self-integrity rather than to remedy specific threats" (Steele, 1988, p. 289). This affords people considerable flexibility in how they respond to psychological threats. Subsequent extensions of the theory (e.g., Cohen & Sherman, 2014; Sherman, 2013; Sherman & Cohen, 2006) have built on this core assumption.

According to Self-Affirmation Theory, therefore, one consequence of such flexibility is that self-affirmation can be a source of accuracy and objectivity, rather than distortion, in information processing. By reminding the individual that his or her self-worth is not

solely dependent on the threatened domain, self-affirmation can reduce the extent to which information in that domain threatens the self and enable the individual to engage in more open-minded appraisal of potentially threatening self-relevant information.

The prediction that self-affirmation may be a source of accuracy and objectivity in information processing has been supported by a large body of research (Cohen & Sherman, 2014; Sherman & Cohen, 2006). For example, in the health domain, evidence suggests that experimental manipulations of self-affirmation can reduce and even eliminate defensive resistance to unwelcome health-risk information and encourage greater readiness to change risky behavior (Epton, Harris, Kane, van Koningsbruggen, & Sheeran, 2015). In the educational context, self-affirmation manipulations have eliminated the achievement gap induced by stereotype threat in African American students (e.g., Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009) and Latino American students (Brady et al., 2016; Sherman et al., 2013) and improved the performance of women studying science (Miyake et al., 2010).

Self-affirming naturally and spontaneously may therefore be associated with tendencies towards resistance and stability – because self-affirmation provides a means of assuaging threats without acting upon the source of those threats – but also with readiness to embrace information and change – because self-affirmation provides a means of confronting threat and thereby reducing defensive resistance. Whether one tendency predominates and, if so, which, in whom and when, are among the questions at the heart of the research program of which the studies reported in this paper form part. Our working hypothesis, based on experimental findings on self-affirmation, was that the tendency to self-affirm naturally would be associated predominantly with greater

openness to threatening information and with generally adaptive responses to challenges and threats.

Spontaneous Self-affirmation and Self-Esteem

By "spontaneous" self-affirmation we mean naturalistic self-affirmation that contrasts with self-affirmation as a manipulation by being "unforced" and occurring naturally as the individual's free response to a perceived psychological threat. Such a tendency has received much less empirical attention than its experimental counterpart, but it has not been entirely neglected as an explanation: recent work has seen researchers advance spontaneous or naturalistic self-affirmation interpretations of phenomena including expressive writing in cancer patients (Creswell et al., 2007), product choice and consumption (Sivanathan & Pettit, 2010; Townsend & Sood, 2012), the response to threats to body image (Bergstrom, Neighbors, & Malheim, 2009) or to vicarious defeat among sports fans (Cornil & Chandon, 2013), and social media use (Toma & Hancock, 2013).

Of particular relevance to the research reported here is an important early contribution to theorizing about spontaneous self-affirmation made by Spencer, Josephs and Steele (1993), who placed the question of individual differences in resiliency to self-threats at the heart of the analysis: "clearly all of us fluctuate in this respect; sometimes and in some settings, we are more resilient than at other times or in other settings. But personal experience suggests there are reliable individual differences in this capacity" (Spencer et al., 1993, pp. 21-22). Spencer and colleagues proposed that the basis for such individual differences lies in the self-evaluative resources available to the individual with which to self-affirm. They proposed that those differences are derived, in turn, from differences in

self-esteem, arguing that those high in trait self-esteem have more self-evaluative resources on which to draw than those low in self-esteem and are consequently more able to self-affirm, and that some routes to self-affirmation are more available to those high in self-esteem, who can bear more potential costs in the form of self-image threats. Their analysis is supported by research showing that, when primed by self-esteem cues, those high in self-esteem respond in similar ways to those who have been self-affirmed experimentally (e.g. Sivanathan, Molden, Galinsky, & Ku, 2008; Steele, Spencer & Lynch, 1993), and engage in less compensatory self-enhancement (Bergstrom et al., 2009; c/f Boney-McCoy, Gibbons, & Gerrard, 1999), and that self-esteem moderates the impact of manipulated self-affirmation on defensive responses, such that those lower in self-esteem benefit more (e.g., Düring & Jesssop, 2014; Holland, Meertens, & Van Vugt, 2002; Nail, Misak, & Davis, 2004; Stone & Cooper, 2003; though see Napper, Harris, & Epton, 2009; Spencer, Fein, & Lomore, 2001, study 2). Overall, research suggests that trait self-esteem may indeed affect the capacity to benefit from self-affirmation manipulations but that enhanced self-esteem is not a general consequence of self-affirmation (Armitage & Rowe, 2011; Sherman & Cohen, 2006).

When considering spontaneous self-affirmation, therefore, Spencer et al. put the question of individual differences in tendency to self-affirm at the forefront (see also Pietersma & Dijkstra, 2012) and considered it essentially in terms of individual differences in self-esteem. We examine whether self-esteem is sufficient to explain individual differences in self-affirmation tendencies and associated outcomes.

Spontaneous Self-Affirmation, Self-Esteem and Habitual Positive Thinking

Based on the prominence of self-esteem in theoretical analyses of self-affirmation processes, we began our analysis by addressing the overlap between individual differences in spontaneous self-affirmation and in the strength of self-esteem related resources. In our empirical research we test whether there are unique or residual correlates of the items we designed to measure spontaneous self-affirmation when controlling for trait self-esteem. However, self-esteem related cognitions should provide greatest benefits when they are both available in memory and accessible in thought (e.g., Spencer et al., 1993); yet measures of trait self-esteem typically assess self-esteem related resources in terms of amount rather than salience or ease of generation. So, to enable us to isolate this additional element – the tendency to automatically access positive self-thoughts – we adapted an existing measure (the Habit Index of Negative Thinking, HINT; Verplanken, Friborg, Wang, Trafimow, & Woolf, 2007), rewording it so that the items described habitual *positive* rather than negative self-related thinking. The resulting measure – the Habitual Index of Positive Thinking (HIPT) – enabled us to identify the extent to which chronic individual differences in tendency to report accessing positive self-thoughts contribute distinctively (i.e., independently of trait self-esteem) to the propensity to respond to threats by affirming self-related cognitions.

The arguments underpinning the importance of distinguishing these measures is as follows. People high in self-esteem have more self-evaluative resources on which to draw than those low in self-esteem and may therefore be more likely to self-affirm (Spencer et al., 1993). However, to facilitate this response, self-esteem related resources need to be accessible in thought and memory; consequently, differences in tendency to use self-affirmation as a means of threat resolution may be determined by chronic individual

differences in the accessibility of, and not solely by differences in the amount of, these resources. Consequently, self-esteem and habitual positive self-thinking together may be sufficient to account for all measured individual differences in spontaneous self-affirmation, and their associated outcomes. However, we hypothesize that there are also individual differences in the tendency to directly respond to threats with self-affirming cognitions *independent* of the quantity and accessibility of self-esteem. Evaluating empirically whether or not this is the case is a central aim of the work reported in this paper.

Sources of Self-Affirmation

To measure the tendency to respond to threats with affirming self-related cognitions, we drew on experimental research employing self-affirmation manipulations and developed a set of items explicitly assessing this response. To encourage people to self-affirm, researchers have most often employed manipulations in which participants consider personally important values and, next most often, reflect upon personal resources such as strengths and attributes, positive traits, skills and performances (McQueen & Klein, 2006). In recent years a literature has also developed that investigates self-affirmation by asking participants to reflect upon their positive social relationships (e.g., Burson, Crocker & Mischkowski, 2012; Cai, Sedikides & Jiang, 2013; Chen & Boucher, 2008).

To measure spontaneous self-affirmation we generated items to assess each of these potentially personally affirming domains: values and principles, strengths and attributes, and social relationships. These sources of self-affirmation are not meant to be completely exclusive or exhaustive – given the fluidity of self-affirmation processes, that is nigh

impossible – but to represent a useful starting point for the research program and, in particular, one derived from major themes in the current literature.

These three sets of items enabled us to test a specific hypothesis – that those lower in trait self-esteem will be less likely to focus on their personal strengths and attributes when self-affirming than will those higher in self-esteem. This hypothesis is based on the assumption that people low in self-esteem have fewer self-evaluative resources on which to draw than do those high in self-esteem (Spencer et al., 1993). We presume that those lower in self-esteem are typically able to draw upon at least a modicum of positive social relations and important personal values to sustain their self-affirmations,[1] but may lack a sense of possessing many positive strengths attributes, traits, skills or performances, whereas those higher in self-esteem will be likely to consider they possess positive instances in all three domains and thus may be inclined to focus naturally on strengths and attributes as being most distinctive. It is important to note that this is an assumption about the effects of self-esteem on the perception of positive aspects of the self-concept and not an assumption about the origins of self-esteem (e.g., Pelham & Swann Jr., 1989). It is also a relative hypothesis, concerning the relative amounts of positive strengths and attributes available to those differing in self-esteem and was developed as a working hypothesis of the research program that was open to empirical test.

Currently there is no clear rationale in Self-Affirmation Theory for hypothesizing any consistent effects on outcomes from drawing predominantly on strengths or values or relationships as a source of affirmation. However, for exploratory purposes, and as a contribution to understanding self-affirmation processes more generally, we do test the relations between the three sources and each of the outcomes assessed in the studies

reported in this paper. We report the findings in supplemental materials and briefly summarize them later in this paper (Section 5).

The Current Paper

The two principal goals of this paper are to (a) establish the relationships between the three core measures – of responding with self-affirming cognitions, habitual access to positive self-thoughts, and trait self-esteem – and (b) examine their relative independent contributions to self-affirmation as a characteristic response to psychological threat. Empirically, we will achieve this in two ways: First (Goal 1), by establishing the degree of observed overlap among the self-affirmation items, the HIPT items, and a trait self-esteem scale (the Rosenberg Self-esteem Scale [RSES], Rosenberg, 1965). Second (Goal 2), by evaluating their joint and unique contributions to relevant outcome variables. In Section 1, we present hypotheses expanding our first guiding assumption that our measure of self-affirmation is not subsumed by its joint relations with trait self-esteem and habitual positive self-thought. In Sections 2-4, we present hypotheses expanding our second guiding assumption that our measure of self-affirmation predicts threat-related outcome variables after controlling for trait self-esteem and habitual positive self-thought. We pursue these goals in five studies presented in text, with others in supplemental materials.

In two item-validation studies, reported in detail in supplemental materials, we assess the empirical overlap among the initial self-affirming cognition items, the HIPT and the RSES. In Section 1 of this paper we report the final stage of scale development for the resulting spontaneous self-affirmation measure (SSAM).

Section 1: Structure and Correlates of the SSAM

Factor Structure

We begin by examining the factorial structure of the items we initially generated to assess spontaneous self-affirmation and those we adapted to assess automatic positive self-thought, using exploratory and confirmatory factor analysis. The initial item-validation studies are presented in supplemental materials and briefly summarized here, where we present in detail the second stage of scale construction and validation. To assess spontaneous self-affirmation in response to threat, two authors (LN, PH) first generated items related to each of the three domains of self-affirmation used in the experimental literature: values and principles (e.g., "thinking about the things I believe in"), strengths, abilities and attributes (e.g., "thinking about the things I am good at"), and social relationships (e.g., "thinking about the people who are important to me"). We worded the associated preamble and stem to make it clear that the items described responses to threat rather than a tendency to reflect upon the self in the absence of threat: "Sometimes when we face difficulties, challenges or problems in our daily lives we can find ourselves thinking about ourselves. We are interested in how often you find yourself thinking about yourself when things start to bother you." To avoid concerns about people being aware of the consequences of self-affirmation or having these as a goal (e.g., Sherman et al., 2009), we worded our items to simply describe the *act* of self-reflection but not the goal, purpose or consequence of such thought. Thus the measure asks, "when I feel threatened or anxious by people or events I find myself …" (stem) "… thinking about my values" (example item). The measure did not ask people to reflect on the extent to which they respond in this way in order to achieve some goal or purpose.

To assess individual differences in chronic tendency to think positively about the self we adapted the HINT (Verplanken et al., 2007) into the HIPT so that the items described habitual *positive* rather than negative self-regard. To enhance the ability to compare responses to the HIPT and spontaneous self-affirmation items, we used the scale employed in the HINT for both measures (1, *disagree completely*, 7, *agree completely*).

Our measure of trait self-esteem was the Rosenberg Self-esteem Scale (Rosenberg, 1965) due to its widespread use, simplicity of language, high level of reliability (Baumeister, 1991), and relevance to previous work on the topic (e.g., Spencer et al., 1993).

Our conceptual and theoretical analysis led us to generate models testing the following assumptions and hypotheses as part of our first goal: (1) the items assessing spontaneous self-affirmation in response to threat will form three positively correlated but distinct first-order factors, (2) these three factors will load onto a single higher order factor, indicating a general tendency to self-affirm in response to threat, (3) these items and the HIPT items will form positively correlated but nevertheless distinct scales, (4) both new scales will be positively correlated with trait self-esteem, but – given the focus of its items on the accessibility of positive self-thoughts – the HIPT scale will be more strongly associated with trait self-esteem than will the SSAM, and (5) the SSAM subscale measuring the tendency to report reflecting upon strengths, abilities and attributes will be more strongly related to the trait self-esteem and HIPT scales than will those measuring reflection upon values or social relations.

In two preliminary studies (see supplemental materials for details) we examined the initial 14-item SSAM and the initial 12-item HIPT using exploratory and confirmatory

factor analysis in a sample of 850 British students.[2] Following this preliminary examination and initial test of hypotheses 1-5, 10 items were retained from the initial SSAM draft items and 11 items were retained from the initial HIPT draft items.[3] The resultant measures were tested for temporal stability in a separate sample. Scores on the higher-order SSAM (.76) and the HIPT (.86) were quite stable over a time period of 1-2 months. Furthermore, this level of stability was not determined by shared variance with self-esteem, as the stability coefficients barely changed (SSAM [.70] and HIPT [.71]) when self-esteem was partialled out of the time 1 and time 2 scores.

As a final step in the development process, to bolster the social relations SSAM factor three additional items were generated and the item "thinking about my family and friends" was split into two items measuring family and friends separately, yielding a total of 14 items across the three subscales. We also created a short version of the HIPT comprising the five highest loading items as assessed in the pilot study; these items are presented in Table 1. This set of items was then subject to analysis in Study 1.

Study 1

Method

Participants were recruited for the study by email and through a social networking site at a UK university. As an incentive, they were entered into a lottery with a chance of winning £100 (then equivalent to approximately US$150) for completing the study. Details of the sample are in Table 2.

Results and Discussion

In a preliminary item screening step, one item meant to load on the Social Relations factor ("thinking about the people who believe in me") had a high cross-correlation with

items meant to load on the Strengths factor and hence was deleted from the scale, leaving a 13-item total SSAM scale, with 4 items defining the Strengths factor, 4 items defining the Values factor, and 5 items defining the Social Relations factor. Using confirmatory factor analysis, and replicating analyses conducted in the preliminary studies, we first fit the SSAM as a higher-order single factor, with three sub-factors representing the three sub-scales, and individual items loading on the relevant sub-scale (see Table 1). The fit of the model was improved by examining modification indices and allowing correlated errors between the most highly related scale items, in this case item 7* (thinking about what I stand for) and 15* (thinking about what I believe in). The first column of Table 1 presents item loadings, test statistics, and sub-scale loadings when the SSAM scale was modeled in isolation. This initial model fit acceptably, CFI = .99, and RMSEA = .05 ($\chi^2(60) = 124.73$, $p < .001$) and, most importantly, fit significantly better than a simple one-factor model with 13 loadings and the same correlated error ($\chi^2(66) = 2139.57$, $p < .001$). Results presented in Table 1 show that loadings for the individual items on the relevant SSAM sub-scale factors were all substantial (at least .76), as were subscale loadings on the higher-order SSAM factor (Values, .85, Social relations, .69, and Strengths, .66). The second column of Table 1 presents the output when the one-factor 5-item HIPT measure is added to the higher-order SSAM CFA model. In this model, the HIPT and higher-order SSAM were allowed to correlate, and a factor-level correlated error was added between the Strengths sub-scale of the SSAM and the HIPT factor to capture hypothesis 5 (that the HIPT and RSES will be associated more highly with the Strengths sub-factor than with either of the other SSAM sub-factors). The SSAM higher-order model and the shortened HIPT showed similarly good item loadings (at least .76,

see Table 1), and were moderately correlated with each other (.42); the correlated error between the strengths sub-factor and the HIPT was also substantial (.46). These analyses provide support for hypotheses 1 through 3 and 5. The third column of Table 1 shows the results of the CFA when the higher-order SSAM was related to both the HIPT and the RSES: the higher-order SSAM was moderately correlated with the RSES factor (.46) and the short HIPT was highly correlated with the RSES (.82) (all *p*s < .001). This final model is depicted in Figure 1. Again consistent with Hypothesis 5, the correlated error between the Strengths sub-factor and the RSES was also substantial (.43, $p < .001$), which indicates that the relation between the Strengths sub-factor and the RSES cannot be explained simply by the correlation between the overall higher-order SSAM factor and the RSES, taking into account the differential reliability of the three SSAM factors. A further (and simpler) test of Hypothesis 5 is to compare the factor-level latent correlations between the RSE and Strengths factor (.62) with the correlation between the RSE and Social Relations factor (.31) and that between the RSE and Values factor (.41)—as predicted, the first correlation is significantly stronger than either of the other two (*p*'s < .001). These analyses therefore support hypotheses 4 and 5.

Overall, Study 1 therefore provided support for hypotheses 1 through 5 (see also preliminary study 1). It also confirmed the factorial structure of the 13-item SSAM (α = .93) and its independent identity from the short HIPT (α = .95) and the RSES (α = .88). Thus, except where otherwise indicated, we use the 13-item SSAM and the 5-item HIPT as our standard measures in the studies we report.

Relations with Individual Differences and Psychological Function: Rationale and Analysis Strategy

In pursuit of goal 2, we have subjected these three core measures to a series of analyses that explore their joint and unique (residual) contributions to variance in an extensive set of other measures and outcomes. The primary aim of these analyses is to establish how the core measures predict a range of outcomes and thereby to chart how the qualities they assess, both together and independently, shape spontaneous self-affirmation. As noted, our interpretation is that the RSE and HIPT will be correlated with the SSAM because the first two measures assess resources that can be used by self-affirmation processes, but nonetheless we strive to show that the SSAM has unique incremental predictive validity beyond the other two measures. In text here we report in detail findings from five studies involving analyses of several key outcomes, including measures of reported responses to psychological threat (section 2), aspects of self-perception and self-function (section 3), and responses to health threats (section 4); many other outcome variables are reported in supplemental materials (as additional findings). Details of the samples in each study are in Table 2. The assumption underlying these tests is that the core measures will predict such state measures in the absence of an explicit threat because people are chronically sensitive to self-integrity threats, which are experienced as pervasive.

We begin the analysis of each study with a CFA testing our assumptions about the model illustrated in Figure 1, thereby undertaking repeated confirmatory testing of the model across studies. (See each study's supplemental materials for details.)

To evaluate the relative contributions of the measures to each outcome, we examined zero-order correlations and then ran "competitive" simultaneous regression analyses using structural equation modelling (SEM) to assess the strength of prediction by each

factor controlling for its associations with the others. Our hypotheses therefore address both correlations and unique (residual) predictions. They are based on (a) the premise that spontaneous self-affirmation enables people to avoid defensive responses to threat and (b) evidence of, or assumptions about, the extent to which each outcome is associated with positive self-regard. We therefore hypothesize that there will be outcomes with which the SSAM will initially correlate but will not predict, because the relationship concerned is primarily a consequence of shared variance with self-esteem rather than one that is unique to responding to threat with self-affirmation, but that there will also be many outcomes that the SSAM will predict independently.

Section 2: Measures of Responsiveness to Threat and to Risk Information

Self-affirmation is one of a range of possible responses to psychological threats (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). In three studies we tested how the core measures predict responses to scales assessing characteristic ways of responding to threat and risk information.

In their Self-Enhancement and Self-Protection Strategies Scale, Hepper and colleagues (Hepper, Gramzow & Sedikides, 2010; Hepper, Sedikides & Cai, 2013) differentiate the four principal ways of responding to psychological threat: a form of reactive self-affirmation labeled *self-affirming reflections* (defined as "cognitive strategies that involve self-affirmation after threat and temporal comparisons", p. 803), two self-enhancing strategies that promote self-protection, *positivity embracement* ("seeking out positive feedback … and capitalizing on it", p. 804) and *favorable construals* ("cognitive strategies that serve to construe the world and self-relevant events in self-flattering ways", p. 803), and finally *defensiveness* ("cognitive and behavioral

strategies that aim to avoid, minimize and reduce the self-relevance of negative feedback and threat", p. 804). Hepper et al. (2010) found that their self-affirming reflections scale was not correlated with defensiveness; otherwise, the strategies were moderately positively inter-correlated.

The Threat Orientation Scale (Thompson & Schlehofer, 2008) identifies four individual differences in responses to threat that differ in their implications for open-minded processing and responsive—rather than defensive – action. In particular, the model differentiates a control-based orientation, which is an action-oriented approach that leads people to "take appropriate actions to reduce the risk", from the denial-based orientations of optimistic denial and avoidance denial, which entail "being overly optimistic about risks, and … motivates people to deny or minimize their risk". The fourth orientation is heightened sensitivity, which involves an anxious sensitivity to risk and is "associated with overestimating one's risk, even when preventative measures have been taken" (all quotes from Thompson & Schlehofer, 2008, p. 1071).

The Risk Information Seeking and Processing Model Scale (R.J. Griffin et al., 2002) operationalizes the distinction between more analytical and in-depth or *systematic* processing and more superficial or *heuristic* processing of risk information.

We hypothesized that the SSAM would correlate positively with and also residually (and positively) predict self-affirming reflections, control-based optimism, and systematic processing. The SSAM has conceptual overlap with self-affirming reflections, control-based optimism reflects optimism rooted in realistic appraisals rather than denial, and the desire to embrace information and understand it often encourages systematic processing (R.J. Griffin et al., 1999).

We hypothesized that the SSAM would correlate positively with, but not residually predict, positivity embracement, favorable construals, and optimistic denial, primarily because we hypothesize that these responses reflect self-esteem needs.

We predicted that the SSAM would not be positively correlated with or residually predict defensiveness, heightened sensitivity, avoidance denial, or heuristic processing. We assume self-affirmation enables people to avoid responses to threat that are driven by defensiveness or by anxiety (including heightened sensitivity and avoidance denial) and militates against the need to engage in superficial information processing.

Participants & Measures

Participants were the samples in Studies 1 ($N = 387$), 2 ($N = 202$), and 4 ($N = 198$) (see Table 2). In Study 1, the *Self-Enhancement and Self-Protection Strategies Scale* (SESPSS, Hepper et al., 2010) measured four strategies: *defensiveness* (18 items, α = .83; e.g., "When you do poorly at something, thinking it was due to the situation, not your ability"), *positivity embracement* (10 items, α = .76; e.g., "Asking for feedback when you expect a positive answer"), *favorable construals,* (6 items, α = .73; e.g., "Getting over the experience of negative feedback quickly"), and *self-affirming reflections* (6 items, α = .77; "Thinking of how you have grown and improved over time"), using a 6-point response scale (1, *not at all characteristic of me*, to 6, *very characteristic of me*). In Study 2, the short-form of the *Threat Orientation Scale* (TOS, Thompson & Schlehofer, 2008) measured four orientations to threat (5 items per scale): *control* based (α = .85; e.g., "When I hear my health is at risk, I try to actively work to decrease my risk in order to alleviate my concerns"), *optimistic denial* (α = .74; e.g., "I rarely think about bad things happening to me"), *avoidance denial* (α = .90; e.g., "I would rather not hear about

health or safety risks that may affect me"), and *heightened sensitivity* (α = .89; e.g., "I am the type of person who worries extensively over a threatening situation") using a 7-point response scale (1, *not at all like me;* 7, *very much like me*). In Study 4, the *Risk Information Seeking and Processing Model Scale* (RISP, R.J. Griffin et al., 2002) measured two processing styles: *Systematic processing* (5 items, α = .78; e.g., "After I encounter information about this topic, I am likely to stop and think about it"), and *Heuristic processing* (4 items, α = .71; e.g., "When I see or hear information about this topic, I rarely spend much time thinking about it"), using a 5-point response scale (1, *Strongly Disagree,* 2, *Disagree,* 3, *Feel Neutral*, 4, *Agree*, 5, *Strongly Agree*).

Results

In each sample we established the model based on item analysis and model fit (see each study's supplemental materials for relevant item tables) and undertook competitive SEM analyses for the three core predictors (see Table 3 for the latent correlation and regression coefficients).

Self-enhancement and self-protection strategies. All core measures correlated significantly positively with self-affirming reflections, positivity embracement and favorable construals, but only the SSAM and the HIPT correlated significantly with defensiveness.[4]

In the SEM analyses, the SSAM significantly (and strongly) predicted self-affirming reflections, but not the reported use of the other responses to threat. In contrast, the HIPT did not predict self-affirming reflections, but was a significant positive predictor of all other responses to threat. The RSES did not predict self-affirming reflections, was a

positive predictor of the two self-enhancing strategies, and a marginally negative predictor of defensiveness (p = .057).

Threat orientation. All core measures correlated significantly positively with control-based optimism. Only the HIPT and RSES correlated significantly with optimistic denial, and only the RSES with avoidance denial and heightened sensitivity. In the SEM regression models, the SSAM predicted control-based optimism positively and optimistic denial negatively. The HIPT predicted control-based optimism positively. The RSES predicted optimistic denial positively, heightened sensitivity and avoidance denial negatively, but did not predict control-based optimism.

Risk information seeking and processing. All core measures correlated significantly positively with systematic processing. However, only the HIPT correlated significantly with heuristic processing. In the SEM regression models, the SSAM predicted systematic processing positively, as did the RSES, but not heuristic processing. The HIPT predicted heuristic processing positively, whereas the RSES predicted it negatively.

Discussion

The three core measures showed similar patterns of correlation with self-affirming reflections, positivity embracement, favorable construals, control-based optimism, and systematic processing, but not with defensiveness, the remaining forms of threat orientation, or heuristic processing. However, controlling for self-esteem and the tendency to automatic positive self-thought measured by the HIPT revealed that those high in SSAM tended to favor self-affirming rather than the other strategies of response to psychological threats, to face the future with control-based optimism rather than

optimistic denial, and to process information systematically. Thus, controlling for these elements has revealed distinctive elements, obscured at the level of association, that appear to be intrinsic to the self-affirmation response to threat. It is notable that core self-affirmation, stripped of self-esteem, appears to be associated with more systematic processing; this is consistent with assumptions underlying much experimental work using self-affirmation manipulations with health-risk information (e.g., Epton et al., 2015).

Overall, the findings were largely consistent with predictions, with two exceptions. The SSAM did not correlate with optimistic denial and predicted it negatively when the other measures were included, in contrast to our prediction that it would correlate with optimistic denial positively but not predict it, suggesting we overestimated the size of the relationship between self-esteem and optimistic denial. The SSAM correlated positively with defensiveness. This appears to stem from a positive correlation between strengths and defensiveness (.29, $p < .001$), perhaps indicating a possible negative outcome of focusing on strengths as a source of self-affirmation (see Study 1 supplemental materials). However, consistent with hypothesis, in SEM analyses the SSAM did not predict defensiveness.

Overall, the studies reveal evidence of relationships that are distinctive to the tendency to report responding to threats by self-affirming and that are consistent with spontaneous self-affirmation being characterized by non-defensive, control-based and systematic responding to threats.

Section 3: Measures of Self-Perception and Self-Function

Little is known about how spontaneous self-affirmation relates to, and is influenced by, self-perception, self-structure, and self-function. To help redress this situation, we

report the findings from three studies testing how the core measures correlate with, and predict, measures of five self-related variables. Of these, two – self-concept clarity and implicit self-esteem – have been hypothesized to be potential mediators of experimental self-affirmation effects and one – self-compassion – overlaps conceptually with both self-esteem and self-affirmation. The others – "cognitive self-affirmation inclination" (CSAI, Pietersma & Dikstra, 2012) and self-integrity (as measured by the self-integrity scale [SIS], Sherman et al., 2009) – are conceptually closely related to the SSAM. As detailed below, we hypothesized that the SSAM would correlate positively with and also residually predict all but implicit self-esteem (which it would correlate with positively but not predict).

Self-concept clarity refers to the extent to which self-beliefs are "clearly and confidently defined, internally consistent, and stable" (Campbell et al., 1996, p. 141). Implicit self-esteem has been defined as "a global self-evaluation that people are unable or unwilling to report" (Buhrmester, Blanton, & Swann Jr., 2011, p. 366). Both self-concept clarity and implicit self-esteem have been proposed as potential mediators of self-affirmation processes (Sherman & Cohen, 2006). Consequently, we were interested in establishing the extent to which the correlation between the SSAM and each of these perceptions (which we hypothesized would be positive) is a product of shared variance with the HIPT and RSES. Our hypothesis was that self-clarity would be associated with more thoughtful and open-minded self-appraisal and so would be residually and positively predicted by the SSAM; however, we hypothesized that any apparent relationship between the SSAM and implicit self-esteem would be a product of self-esteem needs and that the SSAM would therefore not residually predict it.

Self-compassion is an "emotionally positive self-attitude" (Neff, 2003, p. 85) that is considered to lack the negative qualities of extremely high self-esteem (see Neff, 2011, for a review). Self-compassion addresses how individuals respond to negative experiences and threats and, therefore, overlaps conceptually with both self-affirmation and self-esteem. However, while much has been written about its relationship with self-esteem, little is known about how it relates to self-affirmation. We proposed that the SSAM will be positively correlated with self-compassion (as measured by the Self-Compassion Scale, SCS, Neff, 2003) and would residually predict it, along with several SCS subscales: Because self-affirmation should encourage balanced and open-minded appraisal, we hypothesized that the SSAM would positively predict both the self-kindness and self-judgment subscales; based on experimental findings showing self-affirmation encourages self-transcendence (e.g., Burson, et al., 2012), we hypothesized the SSAM would also positively predict the common humanity subscale.

Like the SSAM, the CSAI scale is designed to assess individual differences in self-affirmation; however, unlike the SSAM, the CSAI embodies an assumption that this tendency reflects a stable trait and the measure has been explicitly designed to correlate with self-esteem. We hypothesized that the SSAM would be positively correlated with and also positively predict the CSAI. However, inspection of the CSAI items led us also to hypothesize that the CSAI would relate most closely to the SSAM strengths and attributes factor. Accordingly, we report here also the SEM analyses in which we tested how the three SSAM first-order factors predicted the CSAI (before and after controlling for the HIPT and RSES). Of the SSAM first-order factors we hypothesized that the CSAI would be predicted uniquely by SSAM strengths.

The concept of self-integrity lies at the heart of Steele's (1988) analysis, so naturally we were interested in the extent to which the core measures predicted scores on an attempt to operationalize this concept (the SIS). We therefore hypothesized that the SSAM would positively correlate with, and also uniquely predict, the SIS.

Participants & Measures

Participants are described in Table 2. In Study 1 ($N = 387$) we measured self-concept clarity, implicit self-esteem and self-compassion. In Study 2 ($N = 202$) we measured CSAI. In Study 3 ($N = 218$) we measured self-integrity. The *Self-Concept Clarity Scale* (Campbell et al., 1996) measures self-clarity (12-items, $\alpha = .87$; e.g. "I seldom experience conflict between the different aspects of my personality") using a 7-point scale (1, *Strongly disagree*, 7; *Strongly agree*). The *Full-Name Name-Liking* measure of implicit self-esteem (Gebauer, Riketta, Broemer & Maio, 2008) uses a single item: "How much do you LIKE your name, in total?" with a 10-point response scale (1, *not at all*; 10, *very much*). The SCS (Neff, 2003) measures overall self-compassion ($\alpha = .84$) derived from six subscales: *Self-kindness* (5 items, $\alpha = .83$; e.g., "I try to be loving towards myself when I'm feeling emotional pain"), *self-judgment* (5 items, $\alpha = .79$; e.g., "I'm disapproving and judgmental about my own flaws and inadequacies"), *common humanity* (4 items, $\alpha = .81$; e.g., "I try to see my failings as part of the human condition"), *isolation* (4 items, $\alpha = .79$; e.g., "When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world"), *mindfulness* (4 items, $\alpha = .76$; e.g., "When something upsets me I try to keep my emotions in balance"), and *over-identification* (4 items, $\alpha = .77$; e.g., "When I'm feeling down I tend to obsess and fixate on everything that's wrong"). Responses are given on 6-point scale (1, *Almost never*; 6,

Almost always). The *Cognitive Self-Affirmation Inclination Scale* (Pietersma & Dijkstra, 2012) measures the inclination to use "positive self-images" when the self is threatened (6 items, α = .81; e.g., "I notice I do some things very well"), using a 5-point response scale (1, *never,* 5, *very often*). The SIS (Sherman et al., 2009) is designed to assess the feeling of "general moral and adaptive adequacy" (8 items, α = .86; e.g., "I have the ability and skills to deal with whatever comes my way"), using a 7-point response scale (1, *strongly disagree,* 3, *disagree,* 5, *agree,* 7, *strongly agree*).

Results

As previously, in each study, having established the model based on item analysis and model fit, we undertook competitive SEM analyses (see Table 4 for the latent correlation and regression coefficients).

Self-concept clarity and implicit self-esteem. All core measures correlated significantly positively with self-concept clarity, but only the HIPT and RSES correlated significantly with implicit self-esteem, both positively. In the SEM analyses the RSES was the sole significant predictor of either self-concept clarity or name-liking.

Self-compassion. All core measures correlated significantly positively with self-compassion. In the SEM analysis the SSAM had a significant unique relationship with self-compassion, the RSES was a strong predictor, and the HIPT showed no unique relationship. We also examined the patterns of predictions for the six component subscales of self-compassion. The SSAM positively predicted all positive subscales plus the negative self-judgment subscale. The RSES positively predicted all positive subscales and negatively predicted all negative subscales. The HIPT did not predict any subscale.

Cognitive self-affirmation inclination (CSAI). All three core measures correlated positively with the CSAI and predicted it positively in SEM analyses. Of the first-order SSAM factors, only strengths was a significant predictor (.57) in SEM analyses, notably remaining significant (.35) even with the inclusion of the HIPT and RSES (all $p < .001$).

The self-integrity scale (SIS). All three core measures correlated significantly positively with overall SIS. SEM analyses revealed the RSES to be the sole (and a strong) predictor. However, exploratory factor analysis indicated that the SIS comprises three first-order factors, assessing competence (3 items, e.g., "on the whole I'm a capable person", $\alpha = .79$), morality (3 items, e.g., "I feel that I'm basically a moral person", $\alpha = .81$), and completeness (2 items, e.g., " … I feel a sense of completeness about who I fundamentally am", $\alpha = .86$). All core measures correlated significantly positively with each factor (see Table 4). In SEM analyses, however, the SSAM significantly positively predicted morality, whereas the RSES significantly positively predicted competence and completeness.

Discussion

Overall, this set of analyses has added to our understanding of spontaneous self-affirmation by revealing how the core measures correlate with and predict five distinct aspects of self-perception and function. The three core measures showed similar patterns of correlation with four of the five outcome measures, but diverse and sometimes divergent relationships in the competitive SEM analyses. The SSAM correlated (positively) with self-clarity, self-compassion, the SIS and CSAI, but not name-liking (implicit self-esteem). Controlling for the HIPT and RSES revealed that the SSAM independently predicted self-compassion, self-judgment, CSAI, and the morality factor of

the SIS, but not overall SIS or self-clarity. Thus controlling for these elements has again revealed elements distinctive to the self-affirmation response that are obscured at the level of association and are consistent with responding to the self with both compassion and self-judgment.

The findings were again largely in accordance with predictions. However, contrary to prediction, the SSAM did not correlate with name-liking; more notably, it correlated positively with, but did not predict, self-clarity or scores on the SIS. The failure to predict self-clarity is potentially inconsistent with the idea that self-clarity is a mediator of self-affirmation effects.[5] The failure to predict the SIS results from the high correlation between overall SIS and trait self-esteem. Indeed, when the SIS was decomposed into three sub-factors (following EFA), the SSAM uniquely predicted the morality factor, whereas the RSES significantly predicted the other two factors (competence and completeness), suggesting the original hypothesis was insufficiently refined.

Perhaps most striking was support for the hypothesis that the SSAM would positively predict self-judgment, one of the negative self-compassion sub-scales. This finding is consistent with assumptions about the role of self-affirmation in promoting open-minded self-appraisal without undermining self-regard.

Additional Findings

Space precludes detailed reporting in the body of this paper of the analyses we have conducted of relationships between the SSAM, HIPT and RSES and a large number of other measures; comprehensive details are presented in the Additional Findings sections of the supplemental materials. These diverse outcome measures include scales assessing self-esteem and self-worth; identity, self-presentation and self-evaluation; defensiveness

vs openness; future orientation; approach, avoidance and coping; risk perception and risk behavior; health beliefs and behavior; emotions, stress, and well-being; resources and resilience; and personality. These analyses extend the findings in two ways: by providing additional measures of variables related to those reported in the body of this paper (e.g., measures of defensiveness vs openness, of self-esteem and self-worth) and by extending what is measured (e.g., measures of future orientation, of personality).

Overall, the SSAM had small-to-medium positive correlations with social and virtue-based contingencies of self-worth, adaptive coping strategies and positive emotions, and negative relationships with behavioral inhibition, negative emotions, and maladaptive coping strategies. It was not correlated with aspects of self-worth such as appearance or approval-based contingencies of self-worth, the self-enhancement motive, unstable self-esteem, or the narcissistic personality. Of note, many relationships remained significant in analyses of partial correlations or SEM latent variable regression analyses controlling for shared variance among the core measures (see Additional Findings supplemental materials), suggesting both that there are many elements that are distinctive to responding to threats by reportedly self-affirming and indicating something of the breadth of its correlates. Tests also indicated that the SSAM and RSES often differed in the strength of their zero-order correlations (see Additional Findings supplemental materials). Overall, the tendency to be higher in SSAM appears to be less associated with aspects of evaluation, control, and distance from negative cognition and emotion than is the tendency to be higher in trait self-esteem; when stripped of self-esteem tendency, these aspects of spontaneous self-affirmation are clearly revealed.

Section 4: Predicting Responses to Health Threats

In the final two studies we assess how spontaneous self-affirmation predicts responses to information that potentially challenges self-integrity. In particular, we examine responses to two health threats: the risks of acrylamide in food (Study 4) and of insufficient fruit and vegetable consumption (Study 5). Health threats have been widely used in experimental work on self-affirmation and have provided a reliable test bed in which to assess predictions derived from Self-Affirmation Theory (Cohen & Sherman, 2014). Using health as the focal threat also enabled us to employ outcome measures from experimental work, thus enabling direct comparisons with findings in the experimental literature.

In these studies we explore the correlates and predictions of the SSAM and the HIPT controlling for two different ways of assessing self-regard: trait self-esteem (Study 4) and self-compassion (Study 5).

Study 4: Defensive Versus Open-Minded Responding

In Study 4 we tested how the core measures predicted processing of, and response to, potentially threatening information. Participants read a U.S. Food and Drug Administration (FDA) brochure about the risks of ingesting the chemical acrylamide from fried and baked food. To assess defensive versus open-minded responding we used a set of dependent measures employed in research in related experimental work on self-affirmation (D. W. Griffin & Harris, 2011) that investigated another relatively novel message (about mercury in tuna). Drawing from this, and other experimental work, we hypothesized that the SSAM would be correlated with and positively predict more thoughtful and affectively engaged responding, signifying more open-minded processing, as indicated by ratings of greater depth of thought about the information and higher

message acceptance, perceived personal relevance, vulnerability, and reported negative affect. We also tested for interactive effects between the SSAM and RSES and between the SSAM and consumption. The former tests reveal whether the inclination to respond to threat with self-affirmation is most successful in reducing defensiveness for those with more self-esteem resources to draw upon; the latter enabled us to test whether the inclination to respond to threat with self-affirmation was most successful in reducing defensiveness among those for whom the message was most relevant and who were thus most likely to be defensive, as has been sometimes found in experimental work (e.g., Harris & Napper, 2005).

The study included an experimental component: After completing the core measures, but before reading the brochure, participants were randomized to one of three conditions: a control, a standard, or a novel "embedded", self-affirmation condition.[6] Inclusion of these self-affirmation manipulations principally enabled us to test our hypothesis that the SSAM would predict open-minded responses to threat independently of self-affirmation condition, suggesting that individuals who are prone to spontaneously self-affirm will do so whether they are instructed to or not. We also tested for interactions between the SSAM and condition, to see if the manipulation particularly benefitted those low in SSAM, and for any main effect of condition.[7]

Method. The study was introduced as a "food and personality" study in three sections. The first (on "personality and habits") contained the measures of consumption, demographics and individual differences, including the core measures and RISP. The second presented the manipulation and brochure. The third contained the dependent measures. Some questions (e.g., about attitudes towards various consumer products) do

not form part of the current study and are not reported here. Participants completed the measures online in the sequence described below. Sample details are in Table 2.

Participants. Participants (N = 198) were a community sample who completed the measures online. They ranged in age from 25 to 45 years (M = 34.2 years, SD = 6.05). Most described having being raised primarily in Canada (n = 181, 91%). Further details are in Table 2.

Initial Measures. After giving consent, participants indicated their age, gender, cultural background and the country in which they were "primarily raised". They then answered items about their consumption of a variety of food items, including potato chips and French fries; "How often do you eat … ?" (1, *Never;* 5, *More than once a week*). Consumption was calculated as the mean consumption of chips and fries. Next followed the core measures (including the RISP, see Table 3).

Self-Affirmation manipulation and acrylamide brochure. Participants were randomized to one of three conditions: a standard self-affirmation essay task used in previous studies (e.g., Harris & Napper, 2005) in which they wrote about their most important value before reading the brochure; an embedded self-affirmation condition, in which they were invited to think about one of the three sources of self-affirmation in the SSAM while reading the brochure; or a no-task control condition, in which they were taken straight to the brochure. Further details of the embedded manipulation can be found in the Study 4 supplemental materials.

Next, all participants were provided with a link to an online pdf of a U.S. Food and Drug Administration (FDA) brochure entitled "Information on Acrylamide, Diet, and Food Storage and Preparation" (FDA, 2008). The brochure described acrylamide, offered

advice on diet, and tips for consumers to reduce levels of acrylamide (e.g., by reducing French fries and potato chip consumption).

Indices of defensive versus open-minded responding to the message. All measures were based on those in D. W. Griffin and Harris (2011). Responses were given on 7-point scales. Depth of thought was assessed by two items ("I thought about the risk of acrylamide to my body"; "I thought deeply about the information"; 1, not at all, 7, very much; α = .81). Personal relevance was assessed by two items ("The content of the brochure was relevant to me"; 1, strongly disagree, 7, strongly agree; "The target audience of the brochure is", 1, not similar to me, 7, very similar to me; α = .79). Average other relevance was assessed by the item "The content of the brochure was relevant to the average survey respondent of my age and sex" (1, strongly disagree, 7, strongly agree). Negative affect was assessed by five items (e.g., "I felt fearful while reading the brochure", 1, strongly disagree, 7, strongly agree; α = .92). Personal risk and Average other risk respectively were assessed by the items "How likely do you think you are [the average survey respondent of your age and sex is] to suffer health effects of acrylamide consumed in potato chips, French fries, and other fried or browned foods?" (1, not at all likely, 7, extremely likely). Message acceptance was assessed by five items (e.g., "The evidence linking the consumption of deep-fried or roasted starchy foods with potentially cancer-causing acrylamide is", 1, very weak; 7, very strong; α = .91).

Results. A table describing the model fit statistics can be found in the Study 4 supplemental materials. In this sample the SSAM first-order factors had extremely high inter-correlations (.72-.90) leading to very high loadings on the higher-order factor (with the loading for values set at 1.0 to prevent out-of-range values).

Given the novelty of the message and the complexity of the factors influencing chip and fries consumption, we did not form a hypothesis about the relationship between the core measures and consumption. Nevertheless, for exploratory purposes we conducted analyses. All core measures were correlated positively with consumption; however, there were no significant predictors of consumption in the SEM analyses (see Table 5).

Defensive versus open-minded responding. The SSAM correlated significantly positively with all but the risk measures (Table 5) and, in SEM analyses, positively predicted all dependent measures (being the sole significant predictor of depth of thought and the two relevance measures). The HIPT correlated significantly with some measures, positively predicting negative affect and personal risk. The RSES only correlated significantly with consumption. It was a negative predictor of message acceptance, negative affect and risk perceptions.

Interaction analyses. We used regression analyses on the mean scale scores to examine the interactive effects of the SSAM with the RSES. First we computed cross-product terms between the mean-centered SSAM scores and the mean-centered RSES scores. The main effects for both the SSAM and the RSES were consistent in sign and magnitude with those reported in the SEM analyses above (see Study 4 supplemental materials). There were positive and significant or near-significant interactions between SSAM and the RSES for depth of thought (.17, p = .027), message acceptance (.16, p = .031), personal relevance (.15, p = .044), relevance to others (.19, p = .014), personal risk (.14, p = .057), and average risk (.19, p = .011). The direction of this set of interactions implied that the tendency for individuals higher in SSAM to be more accepting of the message was accentuated among those also high in trait self-esteem.

Likewise, we computed cross-product terms between the mean-centered SSAM scores and the mean-centered consumption scores to test the interactive effects of the SSAM with consumption of chips and fries. There were positive and significant interactions between SSAM and consumption for depth of thought (.17, p = .020), personal relevance (.15, p = .029), and relevance for others (.17, p = .018). The direction of this set of interactions implied that the tendency for individuals higher in SSAM to be more accepting of the message was accentuated among those also high in threat-relevance, as measured by consumption of chips and fries.

The SEM analyses reported above revealed no significant effects of manipulated self-affirmation on outcomes. To examine whether there was nonetheless evidence of interactive effects of the SSAM with the self-affirmation manipulation, we computed cross-product terms between the mean-centered SSAM scores and two contrast-coded variables representing the three self-affirmation manipulation conditions. No interaction between the SSAM and the manipulation conditions approached significance for any of the dependent variables. Full details of these findings can be found in the Study 4 supplemental materials.

Discussion. In a community sample, and as hypothesized, the SSAM items predicted engagement with, and uptake of, the message, even after controlling for trait self-esteem and tendency to think positively about the self habitually and automatically. Indeed, the SSAM predicted message processing and acceptance positively, in contrast to the RSES, which predicted them negatively. Thus the evidence suggests that the relationships between the SSAM and these indices of more thoughtful, engaged and open-minded responding do not simply reflect the relationship between the SSAM and trait self-esteem

but are indicative of something unique to the self-affirmation response tendency. Moreover, these effects were obtained on the same set of message processing and acceptance variables used by D. W. Griffin and Harris (2011) to investigate another novel threat (mercury from tuna) using an experimental manipulation of self-affirmation, suggesting parallels between the consequences of being high in SSAM and completing a self-affirmation task.

Regression analyses revealed that the positive relationships between the SSAM and measures of open-minded message processing were further accentuated for those higher in self-esteem, suggesting that the inclination to respond to threat with self-affirmation is most successful in reducing defensiveness for those with more self-esteem resources to draw upon. Of note, this implies that self-esteem may be complementary to self-affirmation as a route to reducing threats to the self.

The positive relationships between the SSAM and depth of thought and relevance perceptions were also accentuated for those higher in consumption, suggesting that the inclination to respond to threat with self-affirmation was associated with greater message engagement among those for whom the message was most likely to be relevant and who were thus most likely to be defensive. It is notable that those higher in consumption not only reported giving more thought to the message but also being more accepting of its personal relevance; the latter is seen as a critical step in precaution adoption (Weinstein, 1988) and echoes findings in the experimental literature (e.g., Harris & Napper, 2005).

It is important to note that these significant relationships involving the SSAM occurred in the absence of a significant main effect of the experimental manipulation, thereby supporting our hypothesis that the SSAM would predict open-minded responses

to threat independently of self-affirmation condition. Nor was there evidence that the SSAM interacted with the manipulation. However, it is hard to interpret the absence of interactive effects given that the manipulation was in this instance unsuccessful. Of course, there are many potential reasons why a manipulation may not work, but it is important to note this failure, as the tendency in published work on self-affirmation is to report successful manipulations.

Overall, therefore, the SSAM predicted more open-minded responding to the information. It was associated with a set of distinctive responses to the brochure – evident despite controls for relationships between the SSAM, RSES and HIPT – indicating something core to the self-affirmation response.

Study 5: Motivation for Behavior Change

In study 5 we tested how the measures predicted readiness to change behavior following a health threat. Participants responded to information about fruit and vegetable consumption, a behavior that has been the subject of numerous studies using experimental manipulations of self-affirmation. In this study we employed a different measure of self-regard, replacing the RSES with a measure of self-compassion (the self-compassion scale, SCS, Neff, 2003). Self-compassion is positively correlated with trait self-esteem, but is considered to lack some of its negative implications (e.g., Neff, 2011). Importantly, like self-affirmation, self-compassion has been shown to reduce defensiveness and help promote successful self-regulation of health behavior (Sirois, Kitner, & Hirsch, 2014; Terry & Leary, 2011; Terry, Leary, Mehta, & Henderson, 2013). Consequently, the SCS was a useful measure alongside which to probe the predictive effects of the SSAM, overlapping with self-esteem but comprising additional aspects of

self-regard and providing a stringent control variable for comparison purposes. In study 5, therefore, we tested the implications of controlling for SCS for the predictive relationships of the SSAM.

Focusing on fruit and vegetable consumption enabled us to compare responses with those in experimental studies (e.g., Epton & Harris, 2008; Harris et al., 2014; Napper, Harris, & Klein, 2014; Pietersma & Dijkstra, 2011) using a message employed in several of those studies (e.g., Harris et al., 2014). It also enabled us to test the relation between the core measures and baseline behavior for a dietary goal that people typically under-achieve relative to guidelines, despite being aware of those guidelines and accepting that consumption is beneficial (e.g., Centers for Disease Control & Prevention; CDC, 2013; NHS Information Centre, Lifestyles Statistics, 2012). Based on findings from the experimental literature we predicted that the SSAM would be positively associated with fruit and vegetable consumption.

We used a range of measures to assess the impact of the message, including some based on the Theory of Planned Behavior (TPB, Ajzen, 1991), which has been widely used to model health behavior change (McEachan, Conner, Taylor, & Lawton, 2011) and applied in some experimental work on self-affirmation (e.g., Cooke, Trebaczyk, Harris & Wright, 2014; Harris & Napper, 2005; Jessop, Simmonds, & Sparks, 2009). To the two-factor TPB (e.g., Conner, Hugh-Jones, & Berg, 2011) we added measures of (a) moral norms (Godin, Bélanger-Gravel, Vézina-Im, Amireault, & Bilodeau, 2012), given the centrality of values to much of the research on self-affirmation, and (b) the reasons people consider when thinking about why to change, drawn from Behavioral Reasoning Theory (BRT, Westaby, 2005). Consistent with our assumptions about the association

between spontaneous self-affirmation and reduced defensiveness, we predicted that the SSAM would be associated with, and predict, less defensive responses to the message as indexed by more positive responses to the TPB and moral norm and BRT measures.

To further probe open-mindedness versus defensiveness, we also measured the extent to which participants engaged in denial of personal relevance and the use of self-exempting beliefs in response to the message (Thompson, Robbins, Payne, & Castillo, 2011) and whether they derogated the message or showed evidence of message-related anger as an index of emotional reactance to it (see Gardner, 2010). We predicted that the SSAM would negatively correlate with, and predict less, denial, message derogation and anger.

As in study 4 (and for similar reasons) we tested for interactive effects between the SSAM and SCS and between the SSAM and consumption. To provide a further test of the capacity of the SSAM to predict responses to the threat materials independently, the study again included a self-affirmation vs control condition, and we again tested for main effects of condition and the SSAM x condition interaction. To evaluate predictions beyond the immediate setting, the study also had a follow up, in which consumption and other outcome measures were assessed 7 days later. At follow up we also measured action control, a metacognitive self-regulatory process that has been shown to facilitate the translation of intentions into action (Sniehotta, Nagy, Scholz, & Schwarzer, 2006). So doing allowed us to assess whether the SSAM predicted this important self-regulatory process. We hypothesized that it would, primarily because action control involves processes of awareness and monitoring of standards, and self-regulatory effort, that we presumed are qualities possessed by those higher in SSAM.

Method

Participants. Participants were recruited by email from a pool of university staff, graduate and undergraduate students to take part in a study of diet and health beliefs in exchange for entry into a prize draw for up to £50 (approximately $80 at the time). Two hundred and forty-eight participants with no missing values on the time 1 measures (enabling the calculation of full diagnostic statistics in AMOS) comprise the sample. They ranged in age from 18 to 58 years (M = 22.7 years, SD = 6.73), were predominantly female (73%, n = 180), student (94%, n = 233), and white (85%, n = 211). (A participant flow diagram can be found in supplemental materials: Figure S2).

Initial measures. The following measures (in sequence) were taken before participants were given the link to the main study. *Demographic questions* (sex, age, occupation, ethnicity and education level) were followed by items assessing fruit and vegetable consumption, including *baseline fruit and vegetable consumption,* which was assessed using three measures. A link to UK National Health Service information on portion sizes was provided on each page. Measure 1 (Steptoe et al., 2003) assessed consumption on a typical day (one item each for fruit and vegetables, e.g. "How many portions of fruit – of any kind – do you eat on a typical day?"). Measure 2 (from the Cambridge Food Frequency Questionnaire, Bingham et al., 1994) assessed fruit and vegetable consumption in the previous 24 hours by providing participants with a comprehensive list of vegetables and fruit and asking them to indicate how many portions of each they had eaten. Measure 3 (Wardle, Parmenter, & Waller, 2000) assessed consumption in a typical week by asking participants to record how many portions they ate from a list of foodstuffs using a 7-point scale (*None; less than 1 a week; 1-2 a week;*

3-5 a week; 6-7 a week; 8-11 a week; 12 or more a week). Given the different response scales, the measures were standardized before being combined ($\alpha = .74$; c/f Harris et al., 2014). Eligible participants then received the link to the main study.[8]

Experimental manipulation. Using a standard online self-affirmation manipulation (e.g., Harris et al., 2014), participants were randomized either to write about their most important value (self-affirmation condition) giving three reasons why this value was important to them plus an example of something they do to demonstrate it, or to write about why their least important value might be important to someone else (control condition) giving three reasons why this value might be important to someone else plus an example of something they might do to demonstrate it.[9]

Health message. The message was the same as reported in Harris et al. (2014). It was based on materials from the UK Department of Health (2010ab) and Crowe et al. (2011). It described the health benefits of eating fruit and vegetables and comprised a series of screens explicitly stating the UK guidelines, describing the evidence concerning the benefits to health, outlining how fruit and vegetables may work, and why vitamin supplementation is less beneficial. It ended with reminders to eat at least 5 portions every day, advice on portion size and how to increase consumption, and details of where to get more information.

Dependent measures. Measures from BRT (Westaby, 2005) assessed *reason endorsement.* Participants were presented with six reasons for eating at least 5 portions of fruit and vegetables every day (e.g., "because it would help me prevent some illnesses") and four against doing so (e.g., "because it would be too expensive") (order counterbalanced). In each case they were asked to indicate whether for them it was a

reason (0, *not a reason*; 1, *reason*). They were also given space to record any reasons for/against that were not on the list but that were important to them. Following the guidelines in Westaby (2005), the reasons had been generated from a pilot study.

After completing these measures, participants were presented with the TPB items (mostly adapted from Harris, Mayle, Mabbott, & Napper, 2007). Items measured intentions (three items, e.g., "I intend eating at least 5 portions of fruit and vegetables every day in the next 7 days", 1, *strongly disagree*, 7, *strongly agree*; α = .94), attitudes (α = .85; "For me eating at least 5 portions of fruit and vegetables every day in the next 7 days would be …") comprising affective attitudes (four items, *unenjoyable* [1] - *enjoyable* [7], *boring* [1] - *fun* [7], *painful* [1] - *pleasurable* [7], *bad* [1] - *good* [7]; α = .83) and cognitive attitudes (four items, *foolish* [1] - *wise* [7], *harmful* [1] - *beneficial* [7], *useless* [1] - *useful* [7], *unimportant* [1] - *important* [7]; α = .81), injunctive norms (three items , e.g., "Most people who are important to me think that I should eat at least 5 portions of fruit and vegetables every day in the next 7 days", 1, *strongly disagree*, 7, *strongly agree*; α = .69), descriptive norms (three items, e.g., "Most people I know will eat at least 5 portions of fruit and vegetables every day in the next 7 days", 1, *strongly disagree*, 7, *strongly agree*; α = .88), perceived behavioural control (PBC) (three items, e.g., "How much control do you have over whether or not you will eat at least 5 portions of fruit and vegetables every day in the next 7 days?", 1, *no control*, 7, *complete control*; α = .92), and self-efficacy (three items, e.g., "I know for sure that if I wanted to I could eat at least 5 portions of fruit and vegetables every day in the next 7 days", 1, *strongly disagree*, 7, *strongly agree*; α = .89). In addition, we used Godin et al.'s (2012) moral

norms measure (three items, e.g., "I feel morally obliged to eat at least 5 fruit and vegetables every day in the next 7 days", 1, *definitely no*, 7, *definitely yes*; α = .74).

Then followed measures of message derogation (adapted from Jessop et al., 2009; four items, e.g., "The message in the article was… exaggerated/misleading/manipulative/convincing [latter item reverse coded]", 1, *not at all*, 7, *extremely;* α = .76), message-related anger (Gardner, 2010; two items, "The article made me feel … irritated/angry, 1, *not at all*, 7, *extremely;* α = .75), and denial (two measures from Thompson et al., 2011): personal relevance denial (four items, e.g., "Is NOT eating at least 5 portions of fruit and vegetables every day a relevant threat to you?", 1, *not at all*, 7, *very much;* α = .82) and self-exempting belief denial (five items, e.g., "You don't really need to worry about eating at least 5 portions of fruit and vegetables every day unless you have a very unhealthy lifestyle, 1, *not at all*, 7, *very much*; α = .77). Higher scores therefore indicate less personal relevance denial but more self-exempting belief denial.

The survey closed with a section containing a retrospective manipulation check (three items from Napper et al., 2009; α = .83) followed by the 5-item HIPT, SSAM, SCS, and demographic items. The final page had a link to a UK NHS 5 a day site (Department of Health, 2010a, 2010b).

Seven days later, participants were automatically emailed the link to the follow up questionnaire, including the same consumption measures and TPB items used previously (α*s* = .77 to .94) plus the measure of *action control* (Sniehotta et al., 2006; six items, e.g., "During the last 7 days, I have... … often had an intention to eat at least 5 portions of fruit and vegetables every day on my mind*",* 1, *strongly disagree*, 7, *strongly agree*, α =

.93). The follow-up concluded with a set of funnel debriefing questions (Chartrand & Bargh, 1996).

Results

A table describing the model fit statistics can be found in the Study 5 supplemental materials.

The SSAM had significant or near significant correlations with almost all variables, whereas those involving the HIPT and SCS were sporadic (see Table 6).

SEM analyses: baseline consumption. The SSAM was the sole significant predictor of consumption, indicating that it was a diagnostic indicator of a healthy diet as measured by fruit and vegetable intake. As a consequence, we added baseline consumption at a second step in the SEM regression models reported below, and as a step in regression analyses of the follow up data, to examine whether the SSAM predicted responses after controlling for pre-existing dietary behavior.

SEM analyses: reasons for and against. The SSAM was the sole significant predictor of tendency to endorse reasons for eating at least 5 portions of fruit and vegetables in the subsequent 7 days; self-compassion was the sole significant predictor of tendency to reject reasons against doing so. These findings did not change when baseline consumption was added to the predictive model, although self-affirmation condition became a significant predictor of reasons for.

SEM analyses: denial, derogation and anger. The SSAM was the sole significant predictor of personal relevance denial (PRD) and self-exempting belief denial (SEBD), predicting less denial in each case. When baseline consumption was added as a predictor,

the SSAM still predicted PRD but not SEBD. No variable significantly predicted message derogation or anger.

SEM analyses: TPB plus moral norms. The SSAM was the sole significant predictor, positively predicting intentions, attitudes (differentiating the affective and cognitive components affected the size of the relationships but not the statistical significance), injunctive norms, moral norms, PBC, and self-efficacy. There were no significant predictors of descriptive norms. When baseline consumption was added to the model, the SSAM no longer predicted moral norms, PBC, or intentions, but became a significant (positive) predictor of descriptive norms.

Interaction effects. Following the procedure adopted in study 4, we used regression analyses on the mean scale scores to examine the interactive effects of the SSAM with the self-compassion scale. There was a significant interaction on attitudes (-.14, p = .016) and that on SEBD approached significance (.12, p = 052). These interactions imply that the positive relation between SSAM and attitudes, and the negative relation between SSAM and SEBD, were weaker for those higher in self-compassion..

Likewise, we computed cross-product terms between the mean-centered SSAM scores and the mean-centered consumption scores to test the interactive effects of the SSAM with baseline fruit and vegetable consumption. There were significant interactions between SSAM and consumption for intentions (-.13, p = .007), moral norm (-.13, p = .026), PBC (-.13, p = .033) and self-efficacy (-.21, p < .001). The direction of this set of interactions implied that the tendency for individuals higher in SSAM to be more accepting of the message was stronger among those higher in threat-relevance, as measured by their lower consumption of fruit and vegetables.

In addition, as in Study 4, we used regression analyses on the mean scale scores to examine the interactive effects of the SSAM with the self-affirmation manipulation. One interaction, that with message derogation, approached significance, (β = -.11, p = .074), implying that the reduction in derogation related to the SSAM was greater in the experimental condition. Full details of these findings can be found in the Study 5 supplemental materials.

Follow up. Of the time 1 participants, 160 responded to the follow up (64.5%). We first examined whether reported fruit and vegetable consumption at follow-up was related to the SSAM. Not surprisingly, individual differences in consumption were highly stable (r = .67, p < .001). The SSAM, measured at Time 1, was equally predictive of Time 2 consumption (r = .20, p = .012) as of Time 1 consumption (r = .15, p = .016), when examining follow-up participants only. Because of the smaller sample size at follow-up, instead of SEM analyses we conducted a series of hierarchical linear regressions on summed scale scores: SSAM (α = .93) was entered at step 1, the self-affirmation condition, the HIPT (α = .96) and SCS (α = .82) at step 2, and baseline fruit and vegetable consumption at step 3. Baseline consumption was a significant positive predictor of all follow up variables.

At all three steps the SSAM predicted: attitudes (.28, p = .002), injunctive norms (.34, p < .001), and moral norms (.22, p = .017) (all β at step 3). At steps 1 and 2, but not at step 3, the SSAM significantly predicted intentions (.21, p = .026) and action control (.22, p = .022) (both β at step 2). At step 1, but not at subsequent steps, the SSAM significantly predicted follow-up consumption (.20, p = .012), descriptive norms (.23, p = .004), PBC (.24, p = .003) and self-efficacy (.19, p = .018) (all β at step 1).

At step 2, self-compassion predicted injunctive norms (-.17, p = .047), but this effect only approached significance at step 3. The HIPT was not a significant predictor of any variable at either step.

Interaction effects. We again used regression analyses on the mean scale scores to examine the interactive effects of the SSAM. The interaction terms were added as a final step to the hierarchical regressions reported above; adding the interaction at step 3 instead, with baseline consumption as the final step, did not affect the conclusions.

There were only two significant SSAM x Self-Compassion Scale effects: on moral norms (-.18, p = .017) and intentions (-.15, p = .022). The direction of these interactions implies that the positive effects of the SSAM on moral norms and intentions were attenuated for those high in self-compassion. Likewise, there were two significant interactions between SSAM and baseline consumption of fruit and vegetables: on consumption at follow up (excluding outliers, -.17, p = .006) and attitudes (-.18, p = .019). The direction of these interactions implies that the tendency for individuals higher in SSAM to consume more, and to hold more positive attitudes, was accentuated among those also high in threat-relevance, as measured by lower fruit and vegetable consumption at baseline. There were no significant interaction effects involving the SSAM and self-affirmation condition at follow up (see Study 5 supplemental materials).

Discussion

As hypothesized, the SSAM predicted more open-minded acceptance of the dietary message and greater motivation for behavior change. At time 1 the SSAM predicted more fruit and vegetable consumption and, in response to the message, stronger intentions, attitudes, PBC, self-efficacy, injunctive norms, higher moral norms, greater personal

relevance, and less tendency to exempt the self from needing to worry about the threat. Indeed, at time 1 the SSAM was typically the sole predictor in the model. The SSAM was also the sole significant predictor of the tendency to endorse more reasons for eating at least 5 portions of fruit and vegetables daily. The SCS was the sole significant predictor of the tendency to endorse reasons against, predicting endorsing fewer of these reasons.

The SSAM was also a frequent predictor of the follow-up variables, including follow-up consumption (at step 1) and action control. Most of these relations were maintained after controlling for the HIPT and SCS, including those with action control, intentions and several measures indicative of maintained motivation for change. Indeed, relationships with attitudes, injunctive norms, and moral norms remained significant even when controlling for baseline consumption. The SCS and HIPT predicted little at follow up and then only marginally.

In contrast to Study 4, where high self-esteem interacted with SSAM to strengthen several of the positive relations found between the SSAM and open-minded processing, self-compassion rarely affected the positive relations between the SSAM and indices of readiness to change behavior, and when it did it typically weakened these relationships. This underlines the distinction between self-esteem and self-compassion and raises the possibility that, unlike self-esteem, self-compassion may serve as an alternative route to self-affirmation in dealing with threats to the self, and is in that sense a substitute rather than a complement.

Once again, the relationships with the SSAM mirrored the findings of studies using experimental manipulations of self-affirmation, in this case both generally in relation to health risk-information (e.g., Epton et al., 2015), and specifically in relation to fruit and

vegetable consumption, where self-affirmation has boosted reports of consumption, intentions, and predictors of intentions following messages much like the one employed in the current study (e.g., Epton & Harris, 2008; Fielden, Harris, Sillence & Little, 2016; Harris et al., 2014; Napper et al., 2014; Pietersma & Dijkstra, 2011). This is further evidence of parallels between the consequences of being high in SSAM and experimental manipulations.

Again, there was little evidence that the SSAM interacted with self-affirmation condition. However, interpretation of this is again complicated by the scarcity of main effects involving condition.

Of note, although most predictions were supported, those involving the derogation and reactance measures were not. Our initial evidence suggests that, contrary to hypothesis, the SSAM is independent of these affect-laden sources of bias and distortion, rather than negatively related to them.

In sum, the individual difference measured by the SSAM was associated with a range of indices of less defensive and more adaptive responding to the information, even after controlling for its relationships with the HIPT and SCS. The SSAM also predicted reports of consumption, both concurrently and subsequently. Overall, the SSAM was uniquely predictive of more open-minded and adaptive responses to the threat materials, consistent with findings from the experimental literature.

Section 5: The SSAM First-Order Factors

In this paper, and in the initial phases of our research program, we have focused primarily on the overall (higher-order) SSAM. In part this reflects the fact that there is no clear rationale in Self-Affirmation Theory for hypothesizing any consistently distinctive

implications of a given source. Nevertheless, we did hypothesize that SSAM strengths would be more closely related to trait self-esteem than would SSAM values or social relations (hypothesis 5) – a hypothesis that has been repeatedly supported throughout – and, for exploratory purposes, we routinely tested the relations between these three sources, as measured by the SSAM first-order factors, and each of the outcomes assessed in the studies reported in this paper. These exploratory analyses are reported in supplemental materials in tables containing the zero-order correlations between each core measure and the outcome and the standardized coefficients from a series of hierarchical regression SEM models in the following sequence: (1) prediction by each of the three latent SSAM factors (representing a focus on values, strengths or relations), followed by (2) addition of the HIPT and (3) the RSES. This enabled us both to observe the changes at each step and assess whether a specific first-order factor is a residual predictor.

Table S9 in supplemental materials summarizes the findings and indicates that the three SSAM factors had numerous distinctive residual relationships. Notably, a focus on strengths had several characteristic relationships relative to a focus on either values or social relations, even after controlling for the RSES and HIPT. Strengths—stripped of the common variance shared with values and social relations – was a negative predictor of self-clarity and the only SSAM factor predicting defensiveness, the two self-enhancing SESPSS responses (positivity embracement and favorable construals), the CSAI scale (and most of its items – see Study 2 supplemental materials) and RISP heuristic processing (all positively); it also negatively predicted several processing measures (depth of thought and relevance) in Study 4. In contrast, SSAM values uniquely and positively predicted self-clarity, the morality factor of the SIS, the self-judgment subscale

of the SCS, control-based optimism, RISP systematic processing, plus depth of thought and the two relevance measures in Study 4. Many other differences are apparent in tables in the Additional Findings sections of the supplemental materials. Study 5 also revealed some differences in predictive relations. These findings indicate some striking differences in the associations and potential implications of a focus on strengths and on values that are worth pursuing in future research. Furthermore, the tendency to focus on social relations was often a positive (and frequently the sole) predictor of many of the measures in studies 4 and 5, suggesting this focus may also have distinctive implications. However, overall the effects of the unique individual SSAM factors, when they occurred, were often statistically marginal, whereas the effects involving the overall (higher-order) SSAM were typically more numerous and sizable.

General Discussion

In this paper we have sought to explore classic themes from self-affirmation research in the domain of individual differences. For that purpose, guided by the experimental literature, we developed items to measure spontaneous self-affirmation and examined the correlational and predictive relationships of the resulting measure. In this concluding section, we review the main findings of the paper and their implications.

Our first empirical goal was to establish the degree of dependence among self-affirmation as a characteristic response to psychological threat (measured by the SSAM), habitual access to positive self-thoughts (measured by the HIPT), and trait self-esteem (measured by the RSES). To do this, we established the degree of empirical overlap among the three core measures in a large number of samples (Goal 1); furthermore we

evaluated their joint and unique contributions to variance in a wide range of measures and outcomes, both cross-sectional and predictive (Goal 2).

Relevant to Goal 1, the empirical overlaps between the SSAM and the measures of positive self-evaluation (HIPT, RSES) were modest, especially given that the SEM models provide latent correlations disattenuated for any measurement error (mean sample-size weighted latent correlation between the SSAM and the RSES across the independent studies reported in the body of this paper was .46 (with values ranging from .42 to .55); between the SSAM and the HIPT the mean was .38 (ranging from .25 to .43). Not surprisingly, the overlap between the HIPT and RSES was stronger due to their conceptual similarity (mean = .74, with values ranging from .53 to .82). These values indicate moderate overlap and hence considerable independence between the SSAM and the other two core variables (the HIPT and RSES).

Relevant to Goal 2, the findings reported here indicate that there were many variables for which there was independent prediction by the SSAM, whether alone or alongside one or more of the other core variables. The SSAM was positively and uniquely related to the self-affirming reflections subscale of the SESPSS, to optimism rooted in behavioral control rather than optimistic denial, to the tendency to report processing information systematically, to both positive and negative components of self-compassion, and to the readiness to embrace and respond to threatening health materials. In contrast, the SSAM did not predict defensiveness or the more self-enhancing strategies (positivity embracement, favorable construals) measured by the SESPSS, or the tendency to report processing information heuristically. The SSAM predicted many other outcomes alongside prediction by one or other of the core variables. Overall, as hypothesized, the

characteristic SSAM elements appear to comprise those aspects of self-functioning that are indicative of the ability to embrace threat and challenge (and to do so even when controlling for the quantity and accessibility of self-esteem).

Of note, there was also evidence that the HIPT, like the SSAM, predicts in addition to the RSES, in opposition to the RSES (e.g., defensiveness, message processing variables) and when the RSES does not (e.g., control-based optimism). These findings indicate that the HIPT, although assessing a tendency likely diagnostic of those high in trait self-esteem, has certain distinctive correlates and consequences. Indeed, some aspects of the findings suggest that the residual features of the HIPT may encourage open-minded responsiveness and might even isolate genuinely held automatic positivity; in contrast, the residual features of the RSES may assess less genuinely but more consciously held positivity that cannot so readily be deployed to confront threat and challenge, except by self-protective strategies. Future research might usefully address this possibility and, more generally, examine the impact of differentiating defensive from secure high self-esteem on processes and outcomes.

In contrast to the diversity of findings when relating the core measures to concurrent assessments, there was much more uniformity in the patterns of prediction for the outcomes measured prospectively in the context of health threats. Notably, the SSAM predicted virtually all outcomes, and was often the sole significant predictor. Moreover, it predicted these outcomes positively (as on occasion did the HIPT) whereas the RSES typically predicted them negatively. The two studies on health threats thus provide insights into how self-affirmation and self-evaluation act in combination and demonstrate

that the self-affirmation response, as measured by the SSAM, is often uniquely predictive of reduced defensiveness.

In study 4 self-esteem interacted with spontaneous self-affirmation to strengthen several of the positive relations found between the SSAM and open-minded processing, supporting the view that self-esteem is complementary to self-affirmation as a route to reducing threats to the self (cf. Spencer et al., 1993). In contrast, in Study 5 self-compassion rarely altered the many positive relations between the SSAM and indices of readiness to change behavior, and when it did it typically weakened them, suggesting that self-compassion may serve as an alternative route to self-affirmation in dealing with threats to the self, and is a substitute rather than complement. Further research should explore the conditions under which these and other aspects of self-regard operate as alternative or complementary routes to self-affirmation and whether or not relevant self-resources need to be rendered cognitively accessible in order to be deployed.

In studies 4 and 5 there was also evidence that the SSAM interacted with threat-relevance, echoing findings in the experimental literature. However, there was little evidence that the SSAM interacted with the self-affirmation manipulations themselves. Interpretation of this latter finding is complicated by the general lack of effects involving condition in either study and the novelty of the embedded manipulation in Study 4. The paucity of effects involving these affirmation manipulations is worthy of note as it occurs against a backdrop of studies typically reporting significant effects (e.g., Epton et al., 2015). Nevertheless, it is always difficult to interpret null effects, especially following a novel manipulation like that in Study 4.

Currently there is no clear rationale in Self-Affirmation Theory for hypothesizing any consistently distinctive implications of a given source of self-affirmation. Nevertheless, our hypothesis that SSAM strengths would be more closely related to trait self-esteem than would SSAM values or social relations (hypothesis 5) was supported and our exploratory analyses revealed some striking differences in the associations and potential implications of the three different sources of self-affirmation measured by the SSAM that are worth pursuing in future research. These include differences in the pattern of correlations and unique predictions that suggest that values and social relations may be associated with greater openness to threatening information than is a focus on strengths. This is consistent with the recent suggestion that certain types of affirmation (such as unconditional sources of integrity derived from social relations) may be more effective than others (such as those that focus people on narrow self-centered values or sources conditional on meeting external standards, Cohen & Sherman, 2014). The evidence concerning social relations is also consistent with explanations in terms of self-transcendence (Burson et al., 2012), belonging (e.g., Knowles, Lucas, Molden, Gardner, & Dean, 2010) and the benefits of group memberships (Jetten, Haslam & Haslam, 2011). However, it should be noted that there were typically fewer significant relations of the unique individual SSAM factors than of the overall (higher-order) SSAM.

Although the principal aim of these studies was to explore the overlap between individual differences in self-affirmation in reported response to threat and individual differences in self-evaluation, one important outcome has been the creation and validation of a flexible measure of spontaneous self-affirmation for research use. The resulting measure, the SSAM, adds to the repository a relatively brief set of items that

have been road-tested and have more validity evidence than any other available measure of self-affirmation. The measure is also easily shortened and is designed to be modular: given its structure it is easily adapted for other self-relevant content (items can be created to measure sources of self-affirmation other than values, strengths and social relations as the need arises). It is also the only available self-affirmation measure that has identified sub-scales, allowing the differential exploration of the implications of a relative focus on, for instance, strengths, values or social relations. Despite their merits, other available measures appear to be more heavily weighted towards self-esteem (e.g., the SIS) or to measure self-affirmation based mainly on strengths and attributes (the CSAI scale). Most lack or have few conditional items specifying responding to threat (e.g., the CSAI scale, the SAR), an aspect seen as a defining characteristic of self-affirmation by many theorists (see McQueen & Klein, 2006). Nevertheless, researchers can use the evidence presented here to choose which of the available measures purporting to assess spontaneous self-affirmation is most appropriate for a given study.

Research on self-affirmation as a characteristic response to threat is in its infancy relative to work on self-affirmation as an experimental manipulation and, naturally, many questions remain (see Cohen & Sherman, 2014). One such question concerns whether spontaneous self-affirmation is typically beneficial or detrimental. Evidence from the current studies suggests that, as we hypothesized, the tendency to self-affirm naturally is associated predominantly with greater openness to threatening information and with generally adaptive responses to challenges and threats. Indeed, being higher in spontaneous self-affirmation as measured by the SSAM was associated with a range of positive qualities, characteristics and response tendencies, including beneficial reductions

in defensiveness much akin to those demonstrated using experimental manipulations of self-affirmation. Other studies using items from the SSAM show similar positive relations with coping under threat. For instance, in data from a nationally representative US survey (the Health Information National Trends Survey), spontaneous self-affirmation (measured by two SSAM items) was associated with less cognitive impairment and more positive affect among cancer survivors in the sample (Taber, Klein, Ferrer, Kent, & Harris, 2016) and, in the full sample, with indices of well-being (Emanuel et al., 2016), more positive health care experiences and greater information seeking (Taber, Howell et al., 2016); smokers in the sample who scored higher on these SSAM items also reported more quit attempts and quit intentions if they lived in states with more comprehensive smoke-free laws, suggesting they were less reactant (Persoskie et al., 2015). In a sample recruited to an NIH genome sequencing study (ClinSeq®), spontaneous self-affirmation (also measured by two SSAM items) moderated the negative effects of worry (Ferrer et al., 2015) and of tendency to avoid information (Taber et al., 2015) on intentions to receive the genetic sequencing results for preventable diseases. Nevertheless, the possibility remains that the tendency measured by the SSAM may be associated with detrimental as well as beneficial processes and outcomes. More generally, discovering how this tendency relates to the processes by which self-affirmation interventions have been hypothesized to propagate over time (construal, recursion and interaction; Cohen & Sherman, 2014) is an important issue for future research.

Potentially related to the overall benefits of being high in spontaneous self-affirmation is the extent to which “spontaneous” self-affirmation is literally spontaneous,

in the sense of being automatic and reactive, or represents an anticipatory, strategic tendency. We were careful in our wording of the instructions, stem and items not to invite responses driven by consciously aware or planned uses of self-affirmation, and future research may fruitfully address the degree to which people differ in the extent to which they respond to threats deliberately or automatically and whether that is consequential.

There are important ways in which natural or spontaneous self-affirmation and manipulated self-affirmation may differ. Cohen and Sherman (2014) describe how a timely self-affirmation can bring about change through subjective construal, recursion, and interaction (the cycle of "adaptive potential", p. 335). A chronic or habitual tendency to self-affirm in response to threat may not have the same features of timeliness, potentially may have issues of reduced impact through overuse, and may suffer from being explicitly used as a means to an end. Indeed, it is conceivable that usefulness may vary depending on whether people engage in self-affirmation spontaneously with little thought for the consequences – it is just something they do – or whether they do it with the goal of making themselves feel better (Sherman et al., 2009). However, Silverman et al. (2013) have shown how freedom to choose whether or not to self-affirm can override the effects of awareness on the outcomes of self-affirmation, which may be why spontaneous self-affirmation as measured by the SSAM has been found to date to be associated more often with positive than negative effects. Likewise, one of the consequences of a tendency to engage in self-affirmation spontaneously might be to reduce the tendency to experience threat. That is, the world may seem a less threatening place as a result of being naturally prone to respond to threats by self-affirming. Perhaps those high in this tendency have additional skills that enable them to use self-affirmation

at key moments and in ways that are predominantly effective. It may be useful to examine spontaneous self-affirmation as it emerges in daily events and interactions, perhaps using experience-sampling techniques, and to assess whether its effects vary with proneness to experience threat. There remains also a possibility that the tendency to naturally self-affirm might manifest itself in different ways across different people and contexts. Indeed, our studies have provided some initial evidence of possible differential effects associated with focusing on the different sources of self-affirmation (see Section 5). These, and other related questions, provide a rich set of possibilities for future research.

The studies have generated a large number of findings with important implications, but inevitably have limitations that future studies may address. Consistent with the focus on the initial exploration of the correlates of, and prediction by, the core measures, the data are often cross-sectional and self-reported. Some of the outcome measures used here are brief and associated findings require replication with fuller versions or suitable alternatives. There is a considerable number of analyses, so some caution needs to be exercised in interpreting individual findings, especially those that are statistically marginal. We chose not to correct our significance tests for family-wise error rates given that we combined a few core tests with a multitude of secondary, exploratory analyses and we focus on interpreting the broad sweep of highly consistent findings rather than specific outcomes. A number of key patterns have been replicated across the studies presented here; however, we recognize the importance of, and need for, their independent replication in future work. Furthermore, the generality of the effects in groups and cultures other than those sampled here needs to be established. Testing of the predictive

validity of the SSAM and HIPT in contexts other than health, alongside other relevant measures as well as measures of self-esteem or self-compassion, will help broaden our understanding of their respective implications and the processes involved.

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Endnotes

[1] Indeed, the widespread tendency to use values affirmations as the means of successfully inducing self-affirmation (e.g., McQueen & Klein, 2006) relies on values-based resources being available to a wide range of participants, and findings indicating that those low in self-esteem are not disadvantaged by such manipulations (e.g., Napper et al., 2009) or may even benefit most from them (e.g., Düring & Jessop, 2014) suggest that low self-esteem participants can find values with which to self-affirm.

[2] In addition, to control for response tendency, the SSAM contained three filler negative items. These are not included in analyses reported in this paper.

[3] One SSA item ("Thinking about the things I can control") did not load sufficiently on any of the three factors. Three other SSA items ("Recalling times I did the right thing", "Thinking about the things that I value about myself", and "Thinking about the things that are important to me") loaded too highly on two different factors, presumably because they could refer either to personal values or personal strengths. Consequently, these four items were dropped from the analysis. In a preliminary EFA model, all but one of the of HIPT items loaded satisfactorily on a single factor. The exception ("I don't do consciously") was dropped from the analysis.

[4] Of note, the correlation between the SSAM and the self-affirming reflections subscale (.77) was significantly higher than either the correlation between the HIPT and the subscale (.46), $\chi^2(1) = 48.82$, $p <. 001$, or that between the RSES and the subscale (.49), $\chi^2(1) = 56.50$, $p < .001$.

[5] Of note, however, self-clarity was predicted by the SSAM values factor (.15, $p = .026$; see Study 1 supplemental materials).

[6] In the embedded self-affirmation condition participants were required to choose one of the three sources of self-affirmation in the SSAM to think about when reading the brochure. For further details, see the Study 4 supplemental materials.

[7] Experimental condition was included as a predictor in all analyses in studies 4 and 5.

[8] A participant flow diagram can be found in supplemental materials (Figure S2).

[9] Immediately before and after the self-affirmation manipulation we assessed feelings of state self-compassion (Lindsay & Creswell, 2014). Immediately after the manipulation we also measured several other variables, including positive other-related affect (Crocker, Niiya, & Mischkowski, 2008), mood (Aarts & Dijksterhuis, 2003), self-evaluative certainty and subjective self-ambivalence (DeMarree, Morrison, Wheeler, & Petty, 2011). Findings are reported in the Study 5 supplemental materials.

Table 1
Items, Standardized Factor Loadings, Path Coefficients and Diagnostic Statistics, Study 1

Item[a]	Factor	SSAM[b]	SSAM + HIPT[c]	SSAM + HIPT + RSES[d]
1 thinking about my strengths	STREN	.77	.77	.77
9 thinking about the things I am good at	STREN	.90	.88	.89
10 thinking about the things I like about myself	STREN	.89	.89	.89
19 remembering things I have succeeded at	STREN	.80	.80	.80
3 thinking about my values	VALUES	.87	.87	.87
4 thinking about my principles	VALUES	.88	.88	.88
6 thinking about what I stand for	VALUES	.93	.93	.93
18 thinking about the things I believe in	VALUES	.84	.84	.84
5 thinking about the people who are important to me	SOCREL	.91	.91	.91
7 thinking about my family	SOCREL	.81	.81	.81
8 thinking about my friends	SOCREL	.85	.85	.85
15 thinking about the people I love	SOCREL	.91	.91	.91
17 thinking about the people I trust	SOCREL	.76	.76	.77
1 I do automatically	HIPT		.92	.93
2 that feels sort of natural to me	HIPT		.94	.95
3 I do without further thinking	HIPT		.90	.89
4 I would find hard not to do	HIPT		.78	.77
5 that's typically "me"	HIPT		.90	.89
1 do things as well as most other people	RSES			.54

2 person of worth	RSES			.73
3 feel useless at times	RSES			-.54
4 positive attitude to self	RSES			.85
5 at times think I'm no good	RSES			-.59
6 satisfied with myself	RSES			.74
7 number of good qualities	RSES			.66
8 not much to be proud of	RSES			-.55
9 wish more respect for myself	RSES			-.56
10 inclined to feel a failure	RSES			-.73
χ^2		124.73	235.89	557.70
df		60	128	336
NFI[e]		.97	.96	.94
CFI[f]		.99	.98	.97
RMSEA[g]		.05	.05	.04
Path coefficients[h]				
Path a SSAM to HIPT			.42	.42
Path b SSAM to RSES				.46
Path c HIPT to RSES				.82
Path d Values		.85	.85	.85
Path e Social relations		.69	.69	.69
Path f Strengths		.66	.66	.66
Path g uStren to HIPT			.46	.46
Path h uStren to RSES				.43
Values to Relations[i]				.55
Values to Strengths[i]				.56
Relations to Strengths[i]				.45

Note. $N = 387$. SSAM = Spontaneous Self-Affirmation Measure; HIPT = Habitual Index of Positive Thinking; RSES = Rosenberg Self-Esteem Scale; STREN = SSAM strengths & attributes; VALUES = SSAM values & principles; SOCREL = SSAM social relationships. [a]Item number in questionnaire. [b]SSAM higher order single-factor model. [c]SSAM higher order single-factor model plus single-factor HIPT. [d]SSAM higher order single-factor model plus single-factor HIPT plus single-factor RSES; all models with correlated errors. [e]Normed Fit Index. [f]Comparative Fit Index. [g]Root Mean Square Error of Approximation. [h]Paths in Figure 1: a to c are inter-trait correlations, paths d to f are factor loadings, paths g and h are factor-level correlated errors. [i]Latent correlations.

Table 2
Studies Contributing Findings to Sections 2 and 3

Study 1. Participants were recruited for the study by email and through a social networking site at a UK university. As an incentive, they were entered into a lottery with a chance of winning £100 (then equivalent to approximately US$150) for completing the study. They completed a battery of measures, including the three core measures (SSAM, HIPT and RSES), online. Demographic measures included sex, age, ethnicity and occupation. Overall, 387 participants completed all the measures and were entered into the analyses. Of these 248 (64.1%) were female. The participants ranged in age from 18 to 69 years (M = 23.6 years, SD = 8.13) and most (87%) were students. This sample contributes measures to both sections.

Study 2. Participants were undergraduate business students at a Canadian university who completed the measures, including the three core measures, online for bonus course credit as part of a subject pool (N = 202, 69% female; M = 21.8 years, SD = 4.43). Participants reported being raised primarily in Canada (n = 104, 52%) or China (n = 43, 21%). This sample contributes measures to both sections.

Study 3. Participants were two samples of second year undergraduate psychology students at a UK university who completed a battery of measures, including the three core measures, as a filler task during an interlude in a scheduled practical class (combined sample, N = 218, 85% female; M = 19.89 years, SD = 1.09). Sample 1 (N = 95, 85% female; M = 20.0 years, SD = 1.3) completed the 17-item version of the SSAM (see Preliminary Study 2 in supplemental materials); Sample 2 (N = 123, 85% female; M = 19.81 years, SD = 0.93) completed the final 19-item version. This sample contributes to Section 3.

Study 4. Participants (N = 198) were a community sample who completed the measures, including the three core measures, online. They were recruited for the study by a commercial online survey sampling organization and paid $15 as an incentive. Recruitment was targeted to achieve equal numbers of males and females. They ranged in age from 25 to 45 years (M = 34.2 years, SD = 6.05). Most described having being raised primarily in Canada (n = 181, 91%). This sample contributes to Section 2.[a]

Note. Each of these studies also contributes measures to the Additional Findings section of the supplemental materials.
[a] Study 4 also contributes to Section 4.

Table 3
Responsiveness to Threat and to Risk Information: Correlations and Standardized Regression Coefficients

		SSAM	HIPT	RSES
Correlation coefficients				
SESPSS				
	Self-affirming reflections	.77***	.44***	.48***
	Defensiveness	.14*	.17***	.05
	Positivity embracement	.36***	.36***	.36***
	Favorable construals	.60***	.67***	.69***
Threat Orientation				
	Control-based optimism	.45***	.35***	.37***
	Optimistic denial	-.02	.22**	.24**
	Avoidance denial	-.13	-.11	-.36***
	Heightened sensitivity	.04	-.06	-.20*
RISP				
	Systematic	.28***	.21**	.29***
	Heuristic	.06	.21**	-.08
SEM coefficients				
SESPSS				
	Self-affirming reflections	.63***	.08	.13
	Defensiveness	.03	.42***	-.21^
	Positivity embracement	.09	.24*	.20*
	Favorable construals	.09^	.32***	.40***
Threat Orientation				
	Control-based optimism	.31***	.22**	.14
	Optimistic denial	-.19*	.15^	.26*
	Avoidance denial	.06	.09	-.45***
	Heightened sensitivity	.16^	.06	-.30**
RISP				
	Systematic	.19*	-.06	.22*
	Heuristic	.05	.69***	-.54***

Notes. SSAM = Spontaneous Self-Affirmation Measure; HIPT = Habitual Index of Positive Thinking; RSES = Rosenberg Self-Esteem Scale. SESPSS = Self-Enhancement and Self-Protection Strategies Scale (Hepper, Gramzow, & Sedikides, 2010). Threat Orientation = short-form of the Threat Orientation Scale (Thompson & Schlehofer, 2008). RISP = Risk Information Seeking and Processing Model (RISP) (R. J. Griffin, et al., 1999). The core measures are latent variables; the outcome variables are summary scores.
*$p < .05$. **$p < .01$. ***$p < .001$

Table 4
Measures of Self-Perception and Function: Correlations and Standardized Regression Coefficients

	SSAM	HIPT	RSES
Correlation coefficients			
Self-concept clarity	.24***	.31***	.43***
Implicit self-esteem (Full-name liking scale)	.09	.16***	.23***
Self-Compassion Scale & subscales			
Overall self-compassion	.55***	.57***	.70***
Self-kindness	.54***	.47***	.53***
Self-judgment	-.21***	-.46***	-.53***
Common humanity	.60***	.34***	.44***
Isolation	-.27***	-.40***	-.52***
Mindfulness	.49***	.36***	.47***
Over-identification	-.25***	-.39***	-.52***
Cognitive self-affirmation inclination	.58***	.45***	.62***
Self-integrity Scale			
Overall self-integrity	.58***	.64***	.91***
Competence	.54***	.53***	.81***
Completeness	.46***	.62***	.81***
Morality	.40***	.23**	.37***
SEM coefficients			
Self-concept clarity	-.001	-.12	.55***
Implicit self-esteem (Full-name liking scale)	-.07	-.05	.33**
Self-Compassion Scale & subscales			
Overall self-compassion	.14**	.001	.66***
Self-kindness	.25***	.10	.37***
Self-judgment	.16**	-.14	-.53***
Common humanity	.44***	-.09	.34***
Isolation	.06	.004	-.58***
Mindfulness	.28***	-.06	.43***
Over-identification	.08	.04	-.63***
Cognitive self-affirmation inclination	.27***	.19**	.42***
Self-integrity Scale			
Overall self-integrity	.02	.02	.87***
Competence	.08	-.07	.81***
Completeness	-.09	.13	.77***
Morality	.30**	-.09	.25^

Notes. SSAM = Spontaneous Self-Affirmation Measure; HIPT = Habitual Index of Positive Thinking; RSES = Rosenberg Self-Esteem Scale. Self-Concept Clarity Scale (Campbell et al., 1996). Full-Name Name-Liking measure of implicit self-esteem (Gebauer, Riketta, Broemer, & Maio, 2008). Self-Compassion Scale (Neff, 2003). Cognitive Self-Affirmation Inclination Scale (Pietersma & Dikstra, 2012). The Self-Integrity Scale (Sherman et al., 2009). The core measures are latent variables; the outcome variables are summary scores. *$p < .05$. **$p < .01$. ***$p < .001$

Table 5
Study 4. Measures of Defensive vs Open-Minded Responding: Correlations and Standardized Regression Coefficients

	SSAM	HIPT	RSES
Correlation coefficients			
Consumption[a]	.15*	.13*	.19*
Depth of thought	.28***	.15*	.14^
Message acceptance	.30***	.15*	.05
Personal relevance	.23**	.04	.10
Other's relevance	.19*	.09	.09
Negative affect	.23**	.17*	.003
Personal risk	.11	.05	-.14
Other's risk	.12	.03	-.11
SEM coefficients			
Consumption[a]	.01	.06	.20
Depth of thought	.33***	.04	-.11
Message acceptance	.39***	.22^	-.34*
Personal relevance	.32***	-.16	-.003
Other's relevance	.24**	-.03	-.06
Negative affect	.32***	.36**	-.46**
Personal risk	.26**	.36**	-.54***
Other's risk	.28**	.23^	-.45**

Notes. $N = 198$. SSAM = Spontaneous Self-Affirmation Measure; HIPT = Habitual Index of Positive Thinking; RSES = Rosenberg Self-Esteem Scale. SEM analyses include self-affirmation condition (1 = control, 2 = combined experimental). The core measures are latent variables; the outcome variables are summary scores.
[a] Reported consumption of potato chips and fries.
^$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$

Table 6
Study 5. Measures of Motivation for Behavior Change: Correlations and Standardized Regression Coefficients (Time 1)

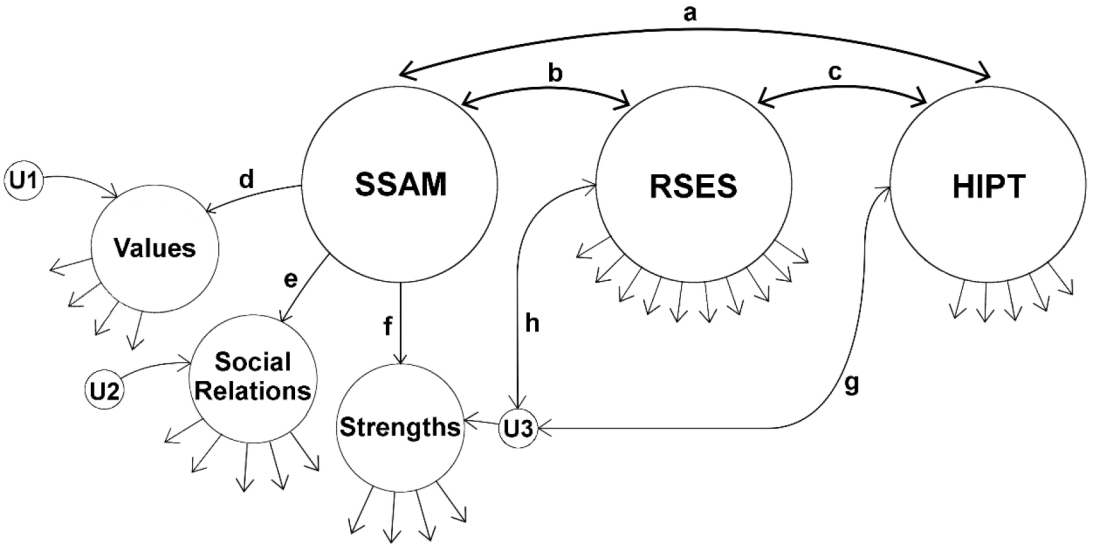
	SSAM	HIPT	SCS
Correlation coefficients			
Baseline fruit & vegetable consumption	.15*	-.01	-.03
controlling for outliers[a]	.14^	-.03	-.04
Reasons for eating more	.26***	.11^	.11^
Reasons against eating more	-.13^	-.03	-.15*
Intentions to eat more	.21**	.05	.03
Attitudes overall	.24**	.05	.09
Affective attitudes	.19*	.05	.06
Cognitive attitudes	.22**	.03	.11^
Injunctive norms	.30***	.22***	.13*
Descriptive norms	.23***	.21**	.15*
Moral norms	.24**	.09	.05
Perceived Behavioral Control	.16*	.07	-.01
Self-efficacy	.30***	.18**	.13*
Message derogation	-.14^	-.02	-.05
Anger induced by message	-.13^	-.06	-.09
Personal relevance denial[b]	.19*	.05	.03
Self-exempting belief denial[b]	-.14^	-.02	-.05
SEM coefficients			
Baseline fruit & vegetable consumption	.21*	-.06	-.04
controlling for outliers[a]	.21*	-.10	-.02
Reasons for eating more	.24**	-.02	.04
Reasons against eating more	-.07	.15	-.30**
Intentions to eat more	.20*	-.04	.06
Attitudes overall	.24**	-.11	.09
Affective attitudes	.19*	-.05	.05
Cognitive attitudes	.24**	-.15	.11
Injunctive norms	.25**	.13	-.03
Descriptive norms	.10	.16^	.07
Moral norms	.22*	.03	-.001
Perceived Behavioral Control	.19*	.06	-.12
Self-efficacy	.27*	.08	-.02
Message derogation	-.14	.08	-.08
Anger induced by message	-.11	.04	-.08
Personal relevance denial[b]	.21*	-.03	-.01
Self-exempting belief denial[b]	-.17*	.09	-.05

Notes. $N = 248$. SSAM = Spontaneous Self-Affirmation Measure; HIPT = Habitual Index of Positive Thinking; SCS = Self-Compassion Scale. SEM analyses include self-affirmation condition (-1, control, +1 experimental). The core measures are latent variables; the outcome variables are summary scores.

[a] Reported consumption of fruit and vegetables after removal of outliers (±2 *SD*s of the mean). [b] Higher scores indicate less personal relevance denial but more self-exempting belief denial.
^$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$

Figure 1. The final three-trait model, showing relations among the first-order and higher-order factors. Coefficients for paths denoted a-h can be found in Table 1 for Study 1 and for other studies can be found in tables in supplemental materials. SSAM = Spontaneous Self-Affirmation Measure; HIPT = Habitual Index of Positive Thinking; RSES = Rosenberg Self-Esteem Scale; U = unique residual variance.

Figure 1


a
b
c
SSAM
RSES
HIPT
U1
d
Values
e
Social Relations
U2
f
Strengths
h
U3
g